

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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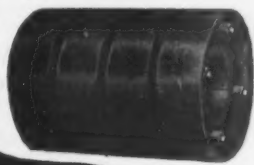
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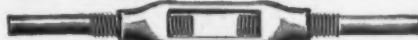
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THE IRON AGE

New York, Thursday, April 5, 1906.

A Comparison of Niagara Power Plants.

BY ORRIN E. DUNLAP.

Opportunity is now afforded at Niagara Falls to compare 10,000 horse-power hydro-electric units of both vertical and horizontal pattern. These installations are in the power stations of the Canadian Niagara Power Company, Fig. 1, and the Ontario Power Company, Fig. 2, both on the Canadian side of the river. Those familiar with the various stages of the Niagara power development will recall the feeling that existed when it was announced that the International Niagara Commission, while in session in London, England, had adopted a 5000 horse-power unit for the development then contemplated by the Niagara Falls Power Company on the New

tors are connected by vertical shafts that extend up the wheel pit. This installation has been so satisfactory that the Canadian Niagara Power Company, allied to the Niagara Falls Power Company, adopted the same method for the development of power in Victoria Park on the Canadian side. However, the Canadian Niagara Power Company made a bold step in advance, and selected a unit of 10,000 horse-power for its development.

These 10,000 horse-power units were the first of the kind to be installed at Niagara, and four are now in place in the power house illustrated in Fig. 1. The over-all diameter of these 10,000 horse-power units is only about 19 feet, and each machine occupies only slightly more space than a machine that has an output capacity of 5000 horse-power. The advantages are a reduction in the cost of construction, a lower cost of



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Fig. 1.—Interior of the Canadian Niagara Power Company's Station, Showing 10,000 Horse-Power Vertical Generating Units.

York State side at the Falls. It was with wonder that many read that a deep wheel pit would be sunk in the earth, and that from the bottom of this pit a big tunnel would be driven right under the city to the lower river and gorge, the tunnel to serve as the tail race to carry off the water discharged from the wheels placed way down in the wheel pit. It was clear to engineers that an efficient head of water would be obtained by this method, but the adoption of a 5000 horse-power unit was a marked advance, for up to that time no such unit had been adopted for a hydro-electric development in this country or Europe.

By April, 1895, the Niagara Falls Power Company's installation was so far advanced that the first unit was tested successfully, and it was recognized that the method of development was destined to win favor. Since then the installations of two great stations have been completed by the Niagara Falls Power Company, the machines having a total output capacity of 105,000 horse-power. In both of these power stations the turbines and genera-

tors and turbines per horse-power, simplicity of operation and reduced cost of maintenance. These generators are wound for three-phase current, 11,000 volts, 25 cycles, at 250 revolutions per minute. The station can be operated in parallel with either or both of the power stations of the Niagara Falls Power Company, cable connections having been made for this purpose by way of the upper steel arch bridge. A transmission line is to be built to Fort Erie and Buffalo along the Canadian side of the Niagara River, a complete right of way having been obtained.

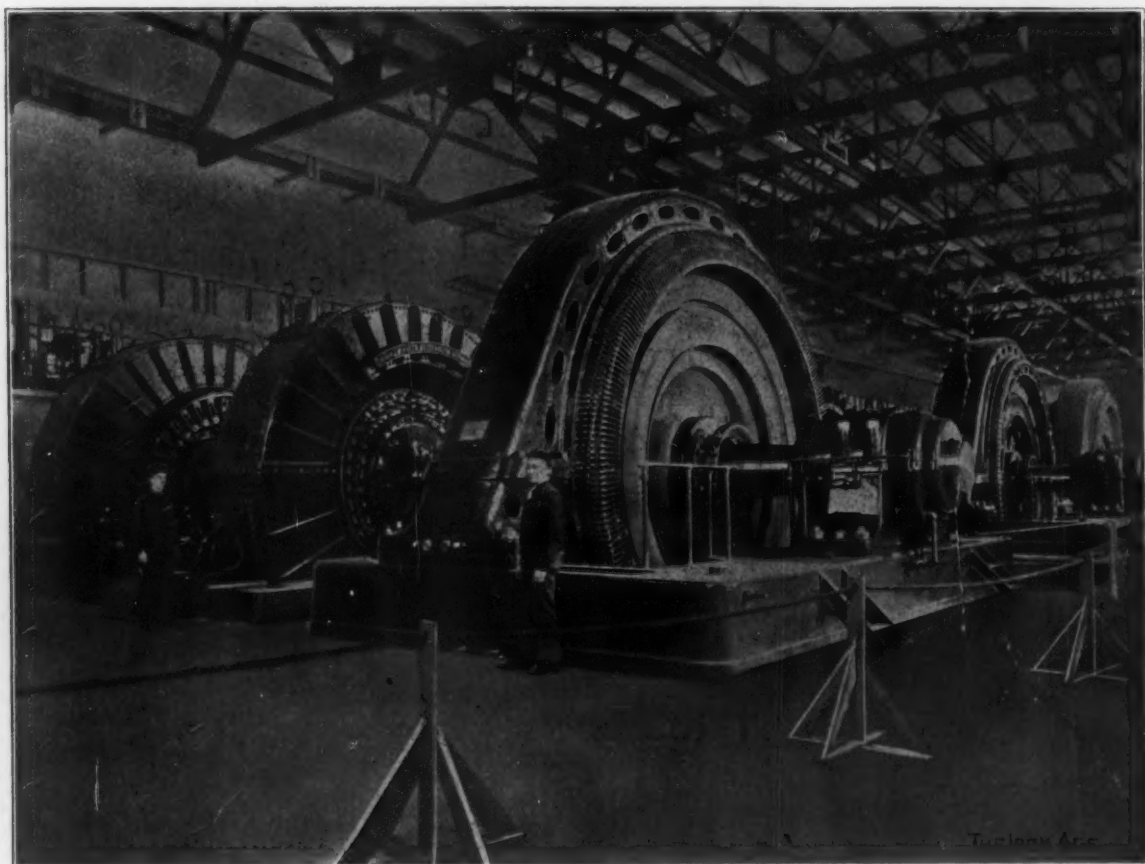
In the power station of the Ontario Power Company the 10,000 horse-power turbine generator sets have been installed on horizontal shafts, as seen in Fig. 2, and these machines form a strange comparison with the generators connected with their wheels by vertical shafts. Previous to the erection of the Ontario Power Company's station on the Canadian side of the river the Niagara Falls Hydraulic Power & Mfg. Company on the New York side had been using the horizontal shaft system,

but in this station each wheel operates two generators, while in the station of the Ontario Power Company the generators are operated by twin wheels direct connected on horizontal shafts. The turbines were made in Germany and the generators were supplied by the Westinghouse Electric & Mfg. Company. The wheels in this station receive their water supply from the 18-foot steel flume laid for over a mile through Victoria Park, and as the power house is at the water's edge in the gorge the tail water soon reaches the river.

The installations in both of the power stations referred to are notable, and will interest engineers who in future visit Niagara. The stations are not very far apart and are easily reached from either side of the river. It is from the generators in the Ontario Power Company's station that current is to be sent to the distributing station on the bluff back of Victoria Park, 550 feet to the rear of the power house and 250 above it. From

normal working load, and in fact this peculiarity of basic steel is its most dangerous feature and the one which English engineers hold in dread. It is, in fact, corroborated by tests of strips cut from the fractured plate in the boiler under notice, which gave a tenacity in two cases of 28.2 and 29.2 tons per square inch, and 24.6 and 22.5 per cent. of elongation on 8 inches.

The *London Times Engineering Supplement* makes this additional comment on the matter: "It is stated that efforts are being made by German steel makers to introduce their basic steel plates to the notice of English boiler makers, and that the low price at which these are offered is a strong temptation to some of the smaller firms engaged in this business, especially when accompanied with guarantees of tensile and elongation tests. It would seem that the interests of the buyer in a matter of this description are even more important when concerned with a steam boiler, liable to explosion, than in other relations of the Merchandise Marks Acts, and, con-



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Fig. 2.—Interior of Ontario Power Company's Station, Showing 10,000 Horse-Power Horizontal Generating Units.

this distributing station the current will be transmitted at a high voltage to Lockport, Rochester and Syracuse.

German Basic Steel in England.

Some discussion has gone on in foreign technical journals relative to German basic steel. A British monthly, *Vulcan*, refers to the fracture of an Austrian steam boiler under hydraulic test, the plates being of German steel made from phosphoric pig; there has been some criticism also of some axles from German works furnished to the Metropolitan District Railway, London. In quoting the following from the journal mentioned attention may be called to the fact that similar criticisms have been passed on other steels imported into England; also that basic open hearth steel as well as basic Bessemer once fell under attack but now takes the place to which chemical and physical tests entitle it:

Phosphoric ores on the Continent have largely determined the employment there of basic methods of making and the general use of basic steel. The advocates of this material shelter themselves behind the results of tensile and bending tests of strips cut from the plate; but experience has shown repeatedly that high tenacity and elongation may be obtained from strips cut from a plate alongside a fracture which has failed under

sequently, that the derivation and nature of the material of such boilers, supposing any be made for sale of these plates, ought to be clearly and prominently indicated on their exteriors."

The United Indurated Fiber Company, Lockport, N. Y., is adding four buildings to its plant for the purpose of manufacturing indurated fiber insulation for third-rail electric systems. Successful experiments have been completed with this style of third-rail insulation and protection, and its manufacture upon a large scale has been decided upon, and it will be used extensively on the elevated roads in New York City. The insulating fiber is formed in shapes, which fit over and entirely cover the top of the rail and the contact trolley or shoe glides along the under side of the rail, which is raised on brackets, instead of the contact being upon the upper surface of the rail as at present. This new form of insulation was perfected by William H. Baker, formerly Mayor of the city of Lockport.

* The output of coal in Great Britain in 1905 was 236,111,150 gross tons, an increase of 3,699,366 tons over that for 1904, or 1.6 per cent.

The International Waterways Commission's Report.

In accordance with the request made in the Burton resolution, the United States section of the International Waterways Commission has made its report on what it believes to be necessary to save the Falls of Niagara from destruction by the diversion of water for power purposes. This report gives a summary of what has already been done by power companies and concludes as follows:

"If the falls are to be preserved it must be by mutual agreement between the two countries. As a step in that direction we recommend that legislation be enacted which shall contain the following provisions:

"The Secretary of War to be authorized to grant permits for the diversion of 28,500 cubic feet per second, and no more, from the waters naturally tributary to Niagara Falls, distributed as follows:

"Niagara Falls Hydraulic Power & Mfg. Company, 9500; Niagara Falls Power Company, 8600; Erie Canal or its tenants (in addition to lock service), 400; Chicago Drainage Canal, 10,000; all other diversions of water which is naturally tributary to Niagara Falls to be prohibited, except such as may be required for domestic use or for the service of locks in the operation of canals. Suitable penalties for violation of the law to be prescribed.

"The foregoing prohibition to remain in force two years, and then to become the permanent law of the land, if in the meantime the Canadian Government shall have enacted legislation prohibiting the diversion of water which is naturally tributary to Niagara Falls, in excess of 36,000 cubic feet per second, not including the amounts required for domestic use or for the service of locks in navigation canals. It is assumed, however, that an understanding upon this subject would be reached by treaty.

"The object of such legislation would be to put a stop to the further depletion of the falls, and at the same time inflict the least possible injury upon the important interests now dependent upon this water power. The amount to be diverted on the Canadian side, 36,000 cubic feet, has been fixed with a view to allowing the companies of that side the amounts for which they now have works under construction.

"Such legislation would give to Canada the advantage of diverting 7500 cubic feet per second more than is diverted in the United States. The advantage is more apparent than real, since the power generated on the Canadian side will be, to a large extent, transmitted to and used in the United States. In the negotiation of a treaty, however, the point should be considered."

The amount above fixed is estimated to be 27 per cent. of the average discharge and 33 per cent. of the low water discharge of the Niagara River.

In connection with this expression of feeling in regard to the preservation of Niagara by the members of the International Waterways Commission, it is worthy of attention that a meeting of municipalities to promote the movement for Niagara power for more people, in accordance with Adam Beck's propaganda, was held in Galt, Ont., March 23. At this meeting, Guelph, London, Bridgeport, St. Thomas, Berlin, Wilmot Township, Waterloo, St. George, Ayr, Galt, Georgetown and Paris, were represented by officials disposed to advance and guard the interests of their respective localities. A resolution was unanimously passed thanking the Union of Municipalities which had subscribed \$15,000 for the Municipal Power Commission, after which the following resolution was adopted:

Resolved, That this gathering of municipalities urgently desires and respectfully asks the Government of Ontario at once to establish a power plant at Niagara Falls or secure the power produced under the existing franchises for distribution to the reachable municipalities of Ontario; and further, that it devises plans to carry the same into effect at the earliest possible moment, this gathering of municipal representatives pledging itself to do everything reasonable within its power to render such action effective.

An unprecedented number of immigrants landed in New York last week. Thursday's vessels brought in 11,383 and Saturday's 9231. The Thursday arrivals broke the record for one day.

The Toronto High Service Turbo Pumping Station.

The city of Toronto, Canada, is installing a pumping station for serving a high pressure fire system, the hose connections to be made direct, dispensing with the use of fire engines in the locality. The entire station equipment, contracted for by the Canadian Westinghouse Company, Ltd., is of the turbine type, power being furnished by steam turbines and the water pressure by multiple stage turbine pumps. The service will be similar in character and extent to that of the Philadelphia high pressure pumping station, which is driven by gas engines. As is the case in Philadelphia, the Toronto plant will supply water at a maximum pressure of 300 pounds per square inch to a high pressure piping system covering the district to be protected. For the present the new high service equipment will comprise two turbo pumping units having a capacity of 5,000,000 gallons per 24 hours at 300 pounds maximum head. It will be installed at the main pumping station, where steam power is available at all times.

Each pump is driven by an 1100 horse-power Westinghouse-Parsons steam turbine. Dry saturated steam is supplied at 150 pounds pressure, and a vacuum of 26 inches is supplied by a jet condenser, one condenser for each unit. To enable the turbine to sustain full load in case of condenser failure, a secondary valve may be used. This valve gives the unit an overload capacity of 50 per cent. or more when running condensing at the usual speed. The speed control of the pumps necessary to vary the delivery pressure according to the demand will be largely effected by hand, and provision has been made for a 30 per cent. variation in speed below the normal speed of 1500 revolutions per minute. As an auxiliary feature the governor operates as an automatic safety stop, preventing a dangerous speed should any part of the regular governing mechanism get out of order, by instantly shutting off the steam supply. For inspecting or repairing either turbine or pump they may be disconnected at a split flexible coupling. The turbine and pump each have two bearings, so that the two parts are independent.

The centrifugal pumps are not particularly designed for it, but are well adapted for direct connection to steam turbines. They are of the two-stage turbine type as developed by Henry R. Worthington, and are manufactured by the John McDougal Caledonian Iron Works, Limited, Montreal. An important and essential feature in the design is the provision of diffusion vanes by which the water delivered by the pump impellers is brought approximately to rest under a static head of 150 pounds per stage. The pumps have been designed so that the axial thrusts are approximately balanced. The pumps take water axially at the center under a suction head of 10 to 15 feet, both delivering into a horizontal 24-inch main connected with the high pressure system. In cases where maximum pressure is necessary the two pressure stages will be operated in series; where lower pressure is desired the speed of the unit will be reduced in proportion. For small fires, where only moderate pressure is required, one pump stage will be eliminated by a by-pass valve delivering suction water directly to the succeeding stage. These valves will be electrically operated.

The complete pumping units are extremely compact, being only about 25 feet in length over all, and are set at 10-foot centers. This close spacing is largely due to the possibility of locating the condensing plant for each turbine directly beneath it in the foundation.

The Buffalo Forge Company, Buffalo, N. Y., gave the heads of its office department a dinner at the Ellicott Club on St. Patrick's Day, at which 24 were present. Mr. Fox of the financial department discharged the duties of toastmaster most acceptably. Impromptu speeches were made by H. W. Wendt, Mr. Lake and others, and every effort was made to promote good fellowship, congeniality and the best of understanding between the various departments represented. Business suggestions were mingled with happy remarks, and all in all it was most enjoyable and profitable.

Canadian Iron and Steel Projects.

The Atikokan Iron Company's furnace is expected to be ready to start up before the end of the summer. The company is said to be contemplating the construction of steel works in connection with the blast furnace. So far nothing has been heard of any high-grade ores being struck in the company's own ranges in the Rainy River district. The Loon Lake deposits, which are closer, being not far from Port Arthur, contain hematite ores, not running high, however, in metallic content. MacKenzie & Mann, who are prominent in the company, are also interested in the fine ore field in Hutton township. Their railroad—the James Bay division of MacKenzie & Mann's Canadian Northern—is now nearly completed from Toronto to Parry Sound. It is to be hurried northward to Sudbury and pushed to the ore body. The ques-

A New Tindel High Duty Saw.

The accompanying illustrations show two views of a machine recently built for the American Locomotive Company by the High Duty Saw & Tool Company, Eddystone, Pa., owners of the Tindel patents for high duty sawing. Although the machine is made primarily for sawing 13-inch square 0.60 carbon steel billets into convenient lengths for forging into locomotive driving axles, it is equally well adapted to the sawing of heavy, irregular shaped pieces, such as forgings and castings. For the latter service it is usually desirable to temporarily remove the special appliance fitted to the machine and shown in the illustration for holding billets. This consists of a massive billet vise with a supplementary table, and constitutes one of the notable features of the tool. The vise is manipulated, as may be seen in Fig. 1, by inserting a heavy bar in holes in the head of the adjusting screw.

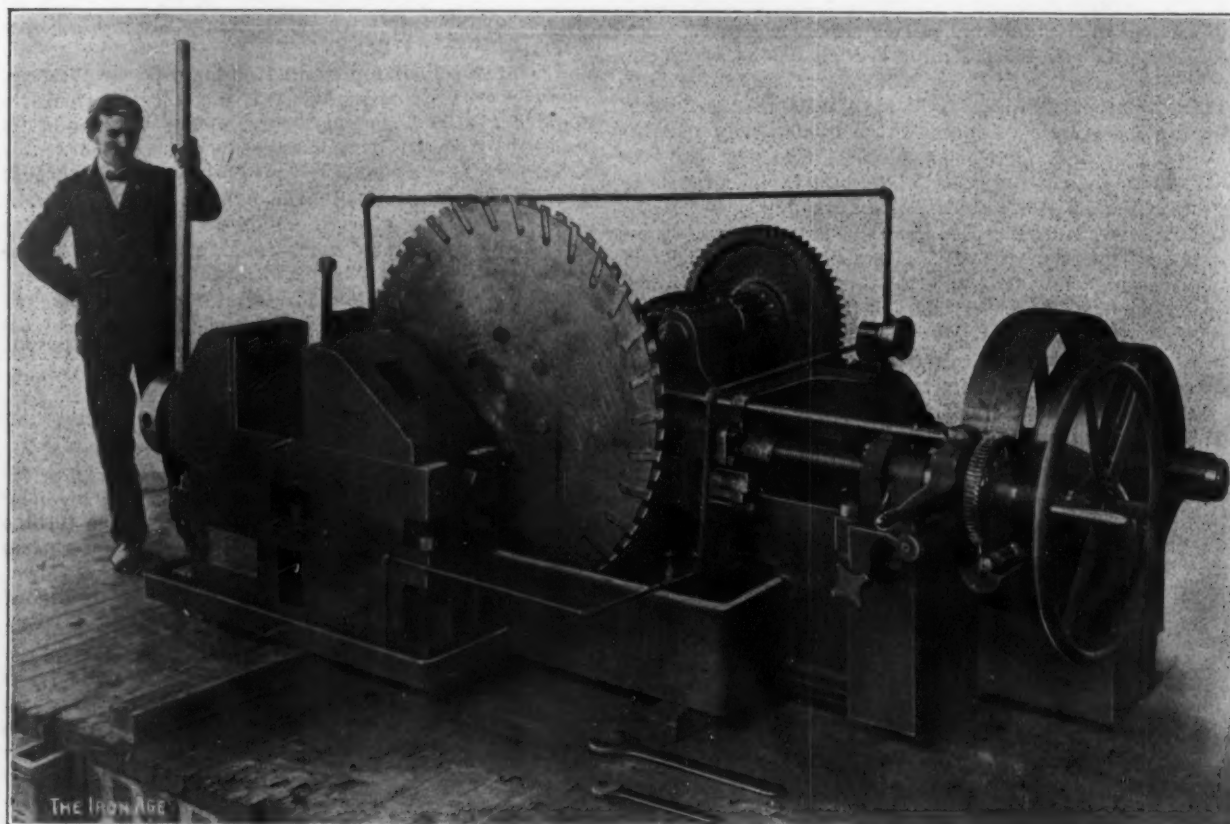


Fig. 1.—An Extra Heavy Saw Built by the High Duty Saw & Tool Company, Eddystone, Pa., for the American Locomotive Company.

tion of hauling the Hutton ores over the company's line to be smelted in Toronto has received some attention. Toronto is desirous of getting an iron and steel industry and would give inducements to attract ore to its Asbridge Bay location.

It is announced from Sault Ste. Marie that contracts have been let for the construction of the Algoma Steel Company's new open hearth furnaces and that work will be begun upon them shortly. Their capacity is to be 200 tons per day. With them it will be possible to use more Helen ore in the company's steel products. The company's rail mill has been surpassing itself. Though built for an output of 500 tons per 24-hour day it has made a record of 802 tons.

At a meeting of veteran employees of the H. C. Frick Company, held in the Connellsville region last week, an organization was formed to be known as the Frick Veterans' Association, to be composed of heads of departments, store managers and superintendents who have been in service for 20 years or more. W. A. Todd was elected president, P. J. Tormay vice-president and J. A. Barnhart secretary and treasurer.

The machine is a large one, as may be judged by its weight, which is about ten tons.

The machine is equipped with a 48-inch Tindel high duty saw blade $\frac{5}{8}$ inch thick, and has 76 high speed steel cutters spaced on alternate sides of the blade. The blade cuts to a depth of 16 inches. The machine is of high power, requiring for its drive a 20 horse-power motor, between which and the saw blade there is a speed reduction of 60 to 1. The main driving shaft is of large diameter, phosphor bronze bushed in its bearings. The spindle is a high carbon steel forging, running in a solid taper phosphor bronze bushed bearing 30 inches long. The construction of the bearing is interesting. To secure rigidity, the ordinary split bearing was not used, the arbor seat being cast solid on the carriage. The saddle carrying the spindle has an unusual surface bearing on the bed of the machine, this being 30 x 26 inches. The saddle is square locked, both front and back, and is gibbed front and back with heavy phosphor bronze taper shoes.

Following the Tindel system of sawing, no worm gearing is used in the main drive, the power being transmitted entirely through straight gearing, as may be seen in Fig. 2. The feed, however, is by roller friction discs transmitted through worm and worm wheel to a heavy screw engaging in a long bearing bronze nut in the back

of the saddle. The friction feed is preferred, as it gives a better gradation than can be accomplished through gearing. The clutch lever shown in Fig. 1, projecting to the front near the feed, is used for disengaging the power feed, so that the saddle may be set by hand through the large hand wheel. This is also connected with the trip, which may be seen in Fig. 2, this being adjustable to stop the feeding at any required point.

The housing and bed plate of the machine are cast in one piece to insure rigidity. This plan also affords opportunity for affixing the massive vise and supplementary table by large bolts, so that the greatest rigidity of the holding appliance is obtained. It is of prime importance in high duty sawing that there be no vibration or spring of the material in cutting, as the effectiveness of high duty sawing depends, in a considerable degree, on the rigidity of the piece to be cut. The table of the machine has numerous T slots which facilitate holding the work directly to the table when the vise is not in use. This top may be removed and placed in a position at right angles to the one shown in Fig. 2, if it is desired to have the T slots run in the opposite direction, or tables of

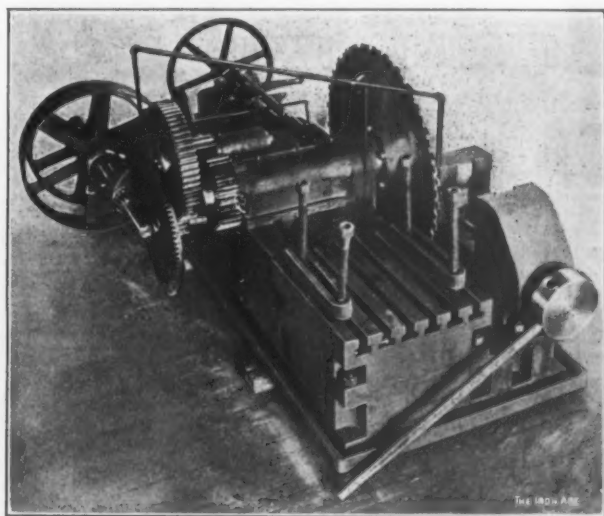


Fig. 2.—Another View of the Saw, Showing the Drive.

other forms may be substituted. Both the vise and the supplementary table are removable, leaving the bed plate of the machine available for such shapes as steel castings, forgings, &c.

To keep the saw cutters lubricated and cool, a plentiful supply of drilling compound is pumped in a steady stream into the kerf by a rotary pump affixed to the machine and operated by a small belt from the main driving shaft. The arrangement of the lubricating pipe is such that it follows the feed of the saw blade and directs the stream at the cutting point on the saw cutters. The lubricating liquid, after falling from the saw blade, is caught in a trough, from which it is returned to the pump.

The machine is designed for a minimum feed of $\frac{1}{2}$ inch per minute and a maximum of $1\frac{1}{4}$ inches. There are two driving pulleys of different sizes, so that the saw blade may be driven at peripheral speeds of either 35 or 50 feet per minute. An automatic stop is provided, placing the depth of cut at all times under the control of the operator.

Previous to shipment this machine was tried at the company's works, and gave a cut of 1 inch per minute on a 14-inch square 0.5 carbon steel billet, without exhibiting any strain on the machine.

On March 19 Judge Joseph Buffington of the United States District Court of western Pennsylvania, sitting at Pittsburgh, handed down decrees in the two suits for patent infringement of the Stirling Company against the Rust Boiler Company. Both decisions were favorable to the Rust Boiler Company, the court holding that there had been no infringement on either patent and dismissing both suits.

Central American Notes.

SANTO TOMAS, March 26, 1906.—It might be interesting to know what some of the British manufacturers are doing in the way of iron, steel and hardware exports to Latin-America generally. El Ferro-Carril del Sur, Buenos Aires, has just received from England a large consignment of air compressors. Between last year and this date over 500 locomotives have reached Chili, Argentina, Brazil and Peru, a few going also to Ecuador and Panama. Chili has taken nearly 20,000 tons of Scotch cast iron pipe. Iron and steel warehouses in sections are sent to the River Plata and the Pacific Coast ports. Bridges and nitrate plants go to Atocama and the mining districts near Antofagasta, also on the Pacific. A British firm of shipbuilders has lately established a yard in Brazil, and it is understood that the Government is backing it with large orders. Much of the sugar machinery, evaporators, &c., of the heavier kinds, made in England and Scotland, go to Ecuador, Guatemala, the West Indies, Nicaragua, and a lesser amount to Costa Rica and Salvador. The Amazon, Madeira, Rio de la Plata, Uruguay, Paraguay, Magdalena and many smaller streams are being supplied from British yards with flat boats, light draft steamers, tugboats and tenders. It is even reported that several twin screw steamers are building on the Toy and Forth for the River Plate, Montevideo, Rosario and Buenos Aires. Agricultural instruments and machinery are going in large quantities to the above named places, Chili, Brazil and Colombia.

When it is considered that most British machinery is heavier, more unwieldy and less finished in many ways than ours, does it not seem that there must be lack of enterprise in some quarters of our country that lets such important business as this slip through its fingers.

Great headway has been made in the last year or two in Spanish-America with regard to sanitation as a precaution against fever. Rio de Janeiro, Brazil, Santos, Para, Havana, Cartagena, Quito, Guayaquil, Panama and a number of less important places have been able to hold yellow fever well in check, and in more than one case it has been eradicated to the great advantage of business in general.

It is reported that at the Pan-American Congress in Brazil next July not a few of the South Americans are hoping for a concise and clear exposition of the Monroe Doctrine. No doubt an impetus will be given also to the Pan-American railroad through Central and South America to Buenos Aires and Chile.

A scheme is on foot to connect by steamer the different ports in the Gulf of Fonseca, Amapala, La Brea, San Lorenzo, La Union (Salvador) and Corinto, Nicaragua, and to be eventually extended to Panama. The promoters of the scheme are principally Germans connected with the export firms of Amapala (Honduras) and La Union. They expect a great increase in trade on the completion of the Tegucigalpa, Honduras Railroad now building.

Several large cargoes of mining machinery have lately arrived at Corinto, La Libertad and San Juan for the gold and silver mines in the Cordilleras. The coffee crop of Salvador will be especially large this season, and the Kosmo-Lerman lines are getting in readiness to handle it. This line is now making its trips from Hamburg via Magellan to Valparaiso, Callao, San Juan, Ocos, Acapulco, &c., to San Francisco.

c.

The United States Treasury continues to show a balance on the right side of the ledger. There was a surplus for the current fiscal year at the close of business March 31 amounting to \$5,772,473. At the end of March, 1905, there was a deficit amounting to \$24,482,011. The treasury officials believe there will be a substantial surplus for the fiscal year ending June 30 next, amounting, possibly, to \$15,000,000.

Advices from Mexico state that the fiscal authorities now consider the gold standard firmly established in that country.

A Modern Steel Foundry of the Square Type.

The foundry of the Baldt Steel Company, New Castle, Del., is of special interest in being a departure from the "long drawn out" design of shop construction that has been followed in so many foundries and machine shops built in recent years. The theory of those who have advocated the "shoestring" construction has been that it afforded advantages in its straightaway crane runways and in lending itself to the continuous progress of material from the receiving end to shipping tracks at the other end. It has been considered by many that a foundry in which large work is handled, being to such an extent a crane proposition, gets relatively more economies from the long building than would be secured by a machine shop. However, the square building for machine shop and structural work finds a good illustration in the plant of the Brown Hoisting Machinery Company at Cleveland, Ohio, which has been occupied now for about three years. That company found that if its plant were

ovens could not be located so that cores and molds could be readily placed in them and removed without unduly interfering with work in the vicinity of the ovens.

Experience had demonstrated to the satisfaction of the projectors of this plant that the distance traveled by molds and finished castings in a long shop is greater than in the type of plant adopted. It was figured that by providing for all departments except the power plant under one roof, the expense of conveying castings from one building to another would be saved, as well as that factor in the cost of separate buildings due to their greater length of outside walls.

Features of Construction.

The buildings are of steel framework, the panels between the columns in the line of the outside walls being filled with brickwork, containing windows extending from 5 feet above the floor line to a few feet below the eaves. The roof is constructed of steel purlins with wooden spiking pieces and 3-inch grooved and splined yellow pine planks. The roof is braced longitudinally by a

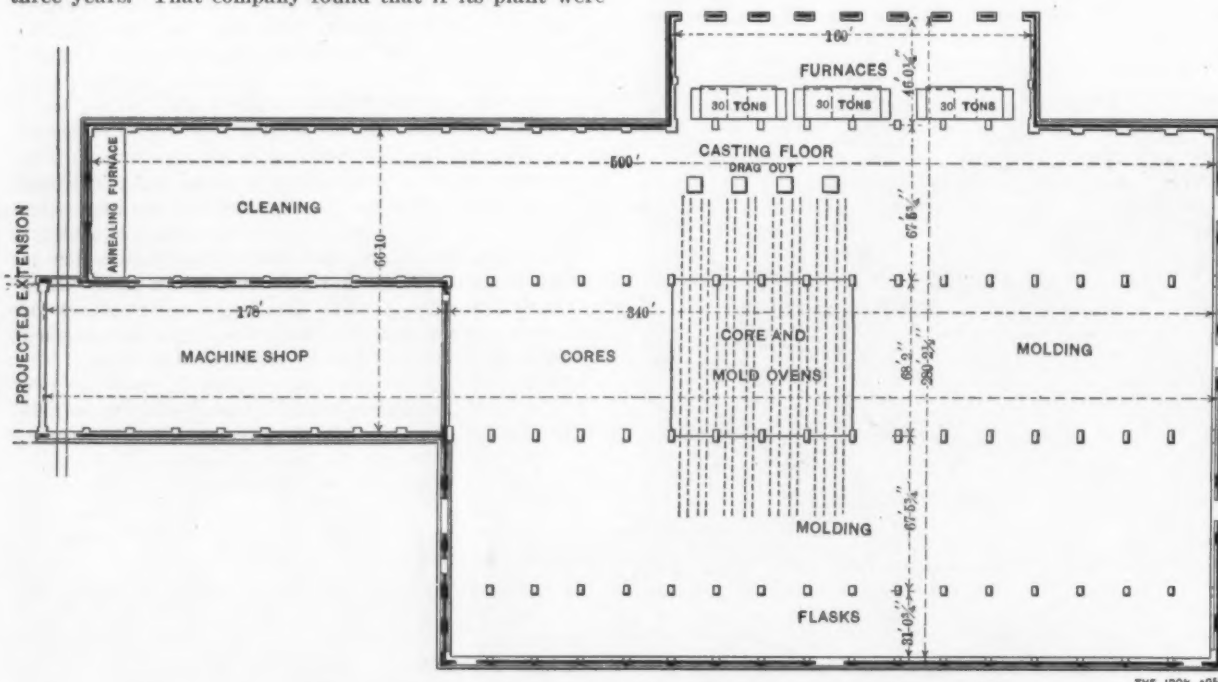


Fig. 1.—Plan View of the Baldt Steel Company's Foundry, New Castle, Del.

built in one long stretch its main building would be 2500 feet long. The superintendent starting from one end would have had to walk half a mile to give an order at the farther end. The design adopted gave a building 500 x 312 feet and under one roof and the results in effective and economical supervision, as well as in handling of work, have been very satisfactory.

The Baldt Steel Company evolved the plan of construction shown in the accompanying illustrations as the result of the long and varied experience of its president, Frederick Baldt, in the well known steel foundries at Chester, Pa., supplemented by the advice and co-operation of its consulting engineer, J. J. Kennedy of 52 Broadway, New York, who designed and built the works. The prime object in the adoption of the square shop was the securing of the highest efficiency per square foot of floor space, the controlling factors being light, ventilation and crane service. The decision against the long narrow shop was based on several considerations. Among these were the loss of time in moving material from one end of the plant to the other; interference with the work of the molders by transferring sand over the same space through which castings, flasks and metal were handled; and, what was of much importance, the difficulty of obtaining thorough supervision, because of the great distances through which the superintendents of such plants are obliged to travel during working hours in order to keep in close touch with the work. Other objections to the long type of plant were the difficulties connected with providing a separate room for machine tools and the drawbacks that core and dry

layer of $\frac{7}{8}$ -inch thick common boards spiked diagonally. This type of roof construction was adopted to reduce the fire risk and to provide the rigid bracing in every direction required by the several lines of cranes operating on parallel runways, also to avoid the expense of heavy structural longitudinal bracing which would otherwise have been required between the interior columns. The roof covering is the Warren-Ehret Company's slag roof construction. Each division of the building has a wide monitor its entire length, equipped with sashes to swing horizontally for light and ventilation.

The Furnace House.

In the furnace house a window approximately 11 feet wide extends from a few feet above the floor to the eaves, in each alternate panel. The panels between windows contain openings 16 feet wide extending from the floor to the roof. These are provided with Kinnear rolling doors. Each end of the furnace house contains one such opening and one window. The thorough lighting of the furnace house is thus always assured, even when all the rolling doors are closed, and in warm weather both the windows and Kinnear doors are opened, the furnace house under such conditions being open on all sides.

During driving rains the windows and Kinnear doors facing the direction from which the wind comes are closed and those on the opposite side and end are left open. In the hottest weather of the summer of 1905 the furnace house employees suffered little or no inconvenience from heat, owing to the shelter and thorough ventilation provided by the above construction.

Arrangement of Floors.

The plan view in Fig. 1 and the cross section in Fig. 2 give a clear idea of the relation of the various foundry floors, and of their equipment. The 35-foot bay used as the flask room is commanded by a 10-ton crane. It is 340 feet long, as is the adjacent molding floor. As appears from the plan, the movement of flasks and material is on the most direct lines, Fig. 1 indicating how conveniently the completed molds after being placed on trucks are conveyed on tracks to the drying ovens in the next bay. Dragouts are provided, so that the molds on

ing floor crane, which is of 30 tons capacity. As will be seen the cleaning and chipping department is in the same bay. It is also equipped with a 30-ton crane. With one exception the gauge of the crane runways is the same throughout the plant, and it is thus possible to transfer cranes from one runway to another if such changes should seem desirable in the future. At the end of the cleaning and chipping department are the annealing ovens 20 x 65 feet, which are below the floor level.

The machine shop, which is virtually a projection of the oven and core room section of the building, is 180

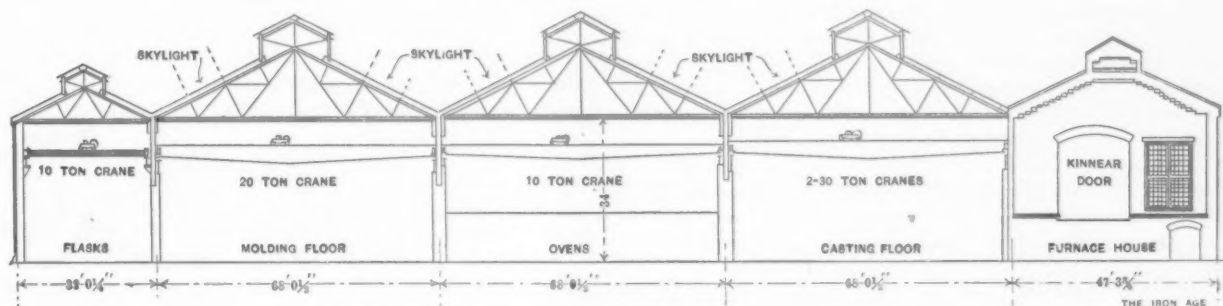


Fig. 2.—Cross Section of the Baldt Steel Company's Plant.

cars may be drawn in and out of the ovens by the use of overhead cranes. A 25-ton crane serves the molding floor and another crane of 30 tons capacity is being installed on this floor. The middle floor, the central portion of which is occupied with the core ovens and mold drying ovens, has the core making department between the ovens and the machine shop. On the other side of the ovens is a space which has been used for the molding of smaller castings, and which may be devoted later to gray iron work, particularly the molding of flask bars. The two mold drying ovens are 65 feet long, 20 feet wide

feet long and 65 feet wide, and the floor is commanded by a crane of 25 tons capacity. It is equipped with planers and shapers, lathes and tool grinders and four cold saws with Taylor-Newbold blades. All tools are motor driven and all power throughout the plant is furnished by electric motors. There are doorways in the wall dividing the machine shop from the floor on which castings are cleaned. These openings are closed with Kinnear doors for the purpose of excluding dust from the machine shop, and the doors are only opened for the purpose of delivering castings from the cleaning floor into

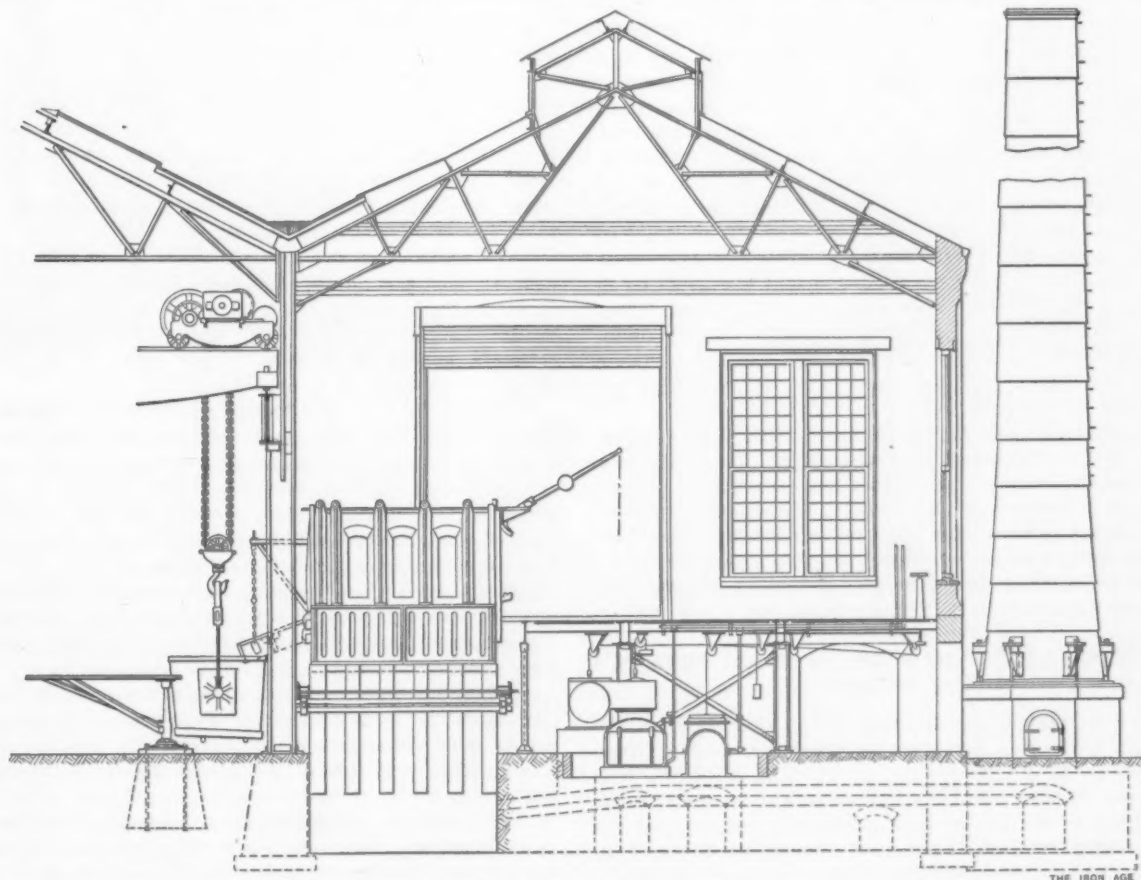


Fig. 3.—Cross Section of Furnace House.

and 20 feet in the clear. A third drying oven will shortly be installed. The two core ovens, which are coal fired, are 45 feet long, 16 feet wide and 12 feet high. The oven and corerom section is commanded by a 10-ton crane.

The molds coming from the dry ovens are placed in position for pouring with but little handling by the cast-

the machine shop. For each of these doorways there is a track and one car. Owing to the large amount of money invested in machine equipment, its maintenance in a highly efficient condition has already proved the desirability of protecting it as far as possible from the gritty dust of the foundry. Finished castings are loaded

on cars at the end of the machine shop, across which runs a standard gauge track.

The gas producers and the power house are the only parts of the plant separated from the main building. The power house is 108 x 75 feet. Two horizontal tube Cahall boilers have been installed, of 500 horse-power. For the cranes and machinery, which are operated at 220 volts, a 200-kw. Westinghouse generator is provided, driven by a Ball & Wood engine. There is a separate circuit for lighting, supplied by a 100-kw. generator, also driven by a Ball & Wood engine. Provision has been made for supplementing the equipment by additional 220-volt direct current generators. There are now installed in the plant two 50-kw. motors, direct connected to each other and mounted upon the same base. These motors are arranged so that either one may be driven by the other as a motor to supply 110 or 220 volt current, as may be required when operating at night under small load. The motors are of the General Electric type. The power house also contains an air compressor, which supplies 12 Rand hammers; also sand blast apparatus. At present the producer house contains three gas producers. Ultimately this number will be increased to seven.

Of the three 30-ton acid open hearth furnaces for which room has been provided in the furnace house two are in operation. A third will be built in the near future. At present pig iron and scrap are unloaded in the yard alongside the furnace house and are conveyed to an elevator and thence to the charging floor, small cars running on a narrow gauge track being employed. Charging into the furnaces is accomplished by the use of furnace peels. A complete set of tracks has been planned and eventually elevated trestles will be provided for the delivery of coal and light scrap.

On the furnace house floor is a completely equipped laboratory, with testing machine for properly handling Government and other work.

Factors in the Location.

The choice of New Castle as the location for the Baldt Steel Company's foundry followed an examination of many sites on the Delaware River water front, from Philadelphia south. New Castle was chosen as being a desirable shipping point for southern as well as northern business, and it was possible to get cheaply a large tract of land, 40 acres being taken, with a frontage of 1000 feet on the Delaware River. Dumpage facilities, which are inadequate in the case of some steel foundries, in view of the large amount of slag made, are ample at the New Castle site to receive the waste of 50 years' operations, and there is fast land as well, sufficient for doubling or trebling the capacity now provided. Labor conditions are quite satisfactory at New Castle also, manufacturing centers being sufficiently near to insure a supply of labor, while the labor troubles common in larger cities are avoided.

Operations were started in April, 1905, and the foundry has been operated full ever since. About 350 men are now employed. The product has consisted of marine, locomotive and steam power work, Government gun carriage and other castings, steel valve body work for high pressures and work in general jobbing lines. Frederick Baldt is president of the company, Rodney Thayer vice-president and Frank A. Thayer treasurer.

The Nichols & Langworthy Machine Company's New Officers.

At the annual meeting of the stockholders of the Nichols & Langworthy Machine Company, held at Hope Valley, R. I., March 28, the officers and directors, who with one or two exceptions have been continuously in the management of the business since 1869 retired, and the following were elected: Ernest J. Jochen, president; Willis G. Nichols, vice-president; John Stewart Thomson, treasurer; Ernest J. Crandall, secretary. These officers, together with James R. Burnett, counsel of the company, constitute the board of directors.

At a meeting of the directors of the New York Safety Steam Power Company, which is controlled by the Nichols & Langworthy Machine Company, held on the same day, the following officers were elected: Ernest J. Jochen, president; John Stewart Thomson, treasurer; J. M. W. Sheperd, secretary. The retiring officers, Henry Clay Nichols and Albert L. Chester, retain a substantial in-

terest in the business. The Nichols & Langworthy Machine Company also voted an issue of \$125,000 of its first mortgage bonds, secured by a mortgage or deed of trust to the Industrial Trust Company of Providence, R. I., the proceeds to be used for additions and extensions to the existing plant, which is to be enlarged and improved. The present business was established in 1820 and has maintained a high reputation in the manufacture and sale of engines and boilers.

The American & British Mfg. Company's Report.

The American & British Mfg. Company, 74 Broadway, New York, one of the subsidiaries of the International Power Company, has issued its third annual report. The income account compares as follows:

	Year ended December 31. 1905.	1904.	Changes.
Gross earnings.....	\$953,777	\$862,211	Inc. \$91,566
Expenses	782,494	772,048	Inc. 10,446
Net earnings.....	\$171,283	\$90,162	Inc. \$81,120
Interest charges.....	30,404	41,924	Dec. 11,520
Surplus.....	\$140,878	\$48,238	Inc. \$92,640

The balance sheet of the company, which is the first ever issued, is of date December 31, 1905, as follows:

Assets.	
Plants at Providence and Bridgeport.....	\$4,667,022
Patent rights, contracts, &c.....	5,205,451
Machinery, patterns, &c.....	300,120
Improvement account.....	24,347
Cash and accounts receivable.....	186,685
Inventories	199,997
Work in process.....	480,686
Total.....	\$11,064,308
Liabilities.	
Preferred stock.....	\$2,000,000
Common stock.....	8,000,000
Bills and accounts receivable.....	514,103
Mortgage on plant No. 2.....	60,000
Surplus	490,205
Total.....	\$11,064,308

President George W. Hoadley's statement to the stockholders is as follows:

"The surplus of \$140,878 will be carried to profit and loss account. This does not show the full net earnings for the year, inasmuch as \$120,000 of the gross earnings represents material billed to the United States Government at cost, as per terms of contract, and profits will not show in earnings until completion of contract and final invoicing of manufactured goods.

"In addition to the above there is about \$300,000 in course of construction in excess of January 1, 1905, which is in reality a part of the earnings of the year. The profits chargeable to this \$420,000 at a very conservative estimate should be at least 15 per cent., which would bring the net earnings to over \$200,000.

"During the year the increase in business, both as to Government work and Diesel engines, has been so extensive that additional machinery equipment was necessary to make contract deliveries. The results of these improvements already show marked deductions in the cost of manufacture and have enabled us to enter the field as competitors for field carriages, caissons, limbers, sights and guns up to 4 inch in our ordnance department, and all classes of pressed steel shapes in our commercial department. This is a field that has never been heretofore entered by this company or its predecessors.

"There have been manufactured and shipped from the Corliss works during the year 40 Diesel engines, aggregating 9200 horse-power, as against 18 engines, 3750 horse-power, in 1904, and 12 engines, 1350 horse-power, in 1903.

"The field for reciprocating steam engine business of large units has been practically filled by new types of engines, and during the past year our revenue from this source has shown a heavy decrease, but we anticipate that the new turbine engine now under construction at the Corliss plant will more than replace the loss of lucrative business in the reciprocating steam engine field.

"The outlook for the company's business for the coming year is very promising. The unfinished contracts on the books of the company aggregate \$1,454,505, as compared with \$595,903 for January 1, 1905. The company has now employed in its shops 876 men, as compared with 422 men January 1, 1905."

The Crescent Angle Band Saw.

When it is desired to use a band saw for cutting at an angle there are two ways of accomplishing it: The commoner one is to provide the saw with a tiltable table, but this is open to the objection that it is sometimes difficult to handle the work. Other machines have been produced in which the saw itself is arranged to tip and the table is kept level. On large work such an arrangement does away with an extra man to help hold the work, and it is also claimed that small work can be turned out more accurately and in less time. The accompanying illustrations show a tilting saw with level table, recently designed by the Crescent Machine Company, Leetonia, Ohio, which is believed to effect the desired object in a more practical manner than former machines built on the same plan. The machine, when in the posi-

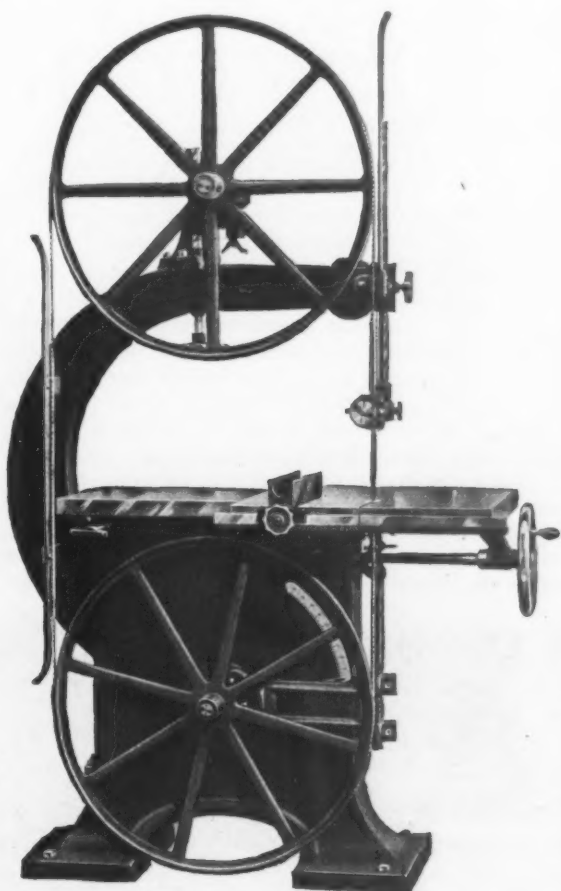


Fig. 1.—The Crescent Angle Band Saw Erect for Square Sawing.

tion shown in Fig. 1, is as well adapted to common square sawing as the ordinary type of band saw. Fig. 2 shows the tilted position.

The principal points in the new saw are that all the parts act automatically, no adjustment being necessary in changing the angle of the saw, and the entire operation is accomplished by simply turning the hand wheel at the side of the table until the pointer indicates the required angle on a graduated quadrant on the pedestal. This may be done while the saw is in motion. The hand wheel turns easily, as the weight of the upper part of the machine is counterbalanced. The driving pulley is located in the usual place, and is as easily belted up as that on an ordinary band saw. When the saw is tipped the table is carried back on the pedestal in proper relation with it, so that the saw keeps its proper position in the saw slot. Exact alignment is maintained of the upper and lower guides of the saw, and the lower guide is held a correct distance from the under side of the table. The tension of the saw is not changed when the angle is changed. The machine is claimed to embody no complicated devices, and owing to its simplicity is less expensive to build than other machines of its class.

The arm is hinged to the pedestal in a rigid manner by a heavy trunnion passing through both, concentric

with the lower shaft, making the machine as rigid when tilted as when standing erect. The bearings for the lower shaft consist of solid bushings fastened into the trunnion, and are provided with oil chamber and capillary felt, making them practically self oiling and dustproof. The upper bearing is made with the revolving shaft running in adjustable bearings, as on the company's regular band saw. The table slides on planed ways on the pedestal and has a steel gib for taking up wear. The saw will tilt to an angle of 45 degrees, a stop being provided at that point, and may also be tilted forward to 4 degrees beyond the perpendicular. A stop is also provided for the perpendicular position, so that this setting may be easily accomplished without referring to the graduated quadrant. This stop can be instantly swung out of place to allow the saw to pass on to an out tilt angle.

The machine, in common with the company's regular line of band saws, is provided with the following features: Spring tension, counterbalanced guide bar, hollow cored out frame, universal adjustments to upper wheel, &c. The following are the principal dimensions:

Size of band wheels.....	36 x 2 inches.
Distance clear between saw and arm.....	36 inches.
Height clear under guide, when raised.....	18 inches.
Size of table.....	28 x 34 inches.
Speed, revolutions per minute.....	400 to 450
Length of blade.....	19 feet.

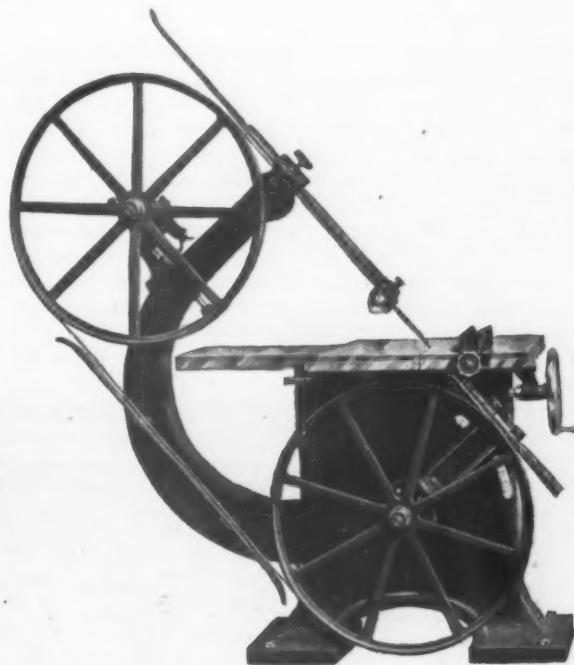


Fig. 2.—The Crescent Angle Band Saw Tilted for Bevel Sawing.

Floor space over all, when erect.....	40 x 63 inches.
Height over all.....	95 inches.
Net weight.....	1650 pounds.

The regular equipment includes a pair of brazing tongs, a brazing clamp, a Wright guide above the table, a $\frac{3}{4}$ -inch wide saw blade, or choice of any width up to 1 inch and one ripping gauge.

In considering the application of electric motor drives, many power users hesitate because of the trouble which seems inevitable in changing over. Thus many old but good machine tools continue to be driven inefficiently where with motor drives they would probably afford a greatly increased output and improved product. The Northern Electrical Mfg. Company, Madison, Wis., is making a campaign to convince power users of the ease of application, convenience of arrangement, location and operation of its electric motors as applied to machine tools. For certain classes of work a special type of variable speed motor, described in *The Iron Age*, February 9, 1905, was developed. Northern multispeed motors, as they are termed, were especially designed for application to engine lathes, but are equally well adapted to the driving of any machine tools that require variable speeds.

The Automatic Annealing of Metals.

The drawbacks of the annealing process are well known. Originally oxidation was the chief of these, and the use of acids has long been resorted to for the removal of the scale formed upon the metal. The filling of annealing pots or boxes with coal dust and charcoal was one recourse, these being designed to form carbon dioxide or monoxide and thus absorb the oxygen contained in the atmosphere confined in the pot. Sand, scale and scrap were also used; or a gas free from oxygen—a hydrogen gas or an ordinary coal gas—was introduced under pres-

scends at the ends, which are sealed by water contained in tanks. The metal to be annealed is conveyed through the chamber on an endless chain belt. Unannealed metal placed in the conveyer at one end is drawn first through one water seal, then through the heated portion of the tube and out through the other water seal, by which it is cooled. The water seals thus form entrance and exit doors to the furnace.

Fig. 1 is a longitudinal section through the apparatus, *a* being the annealing chamber and *b* the furnace in which it is heated. The lower ends of the downwardly inclined mouthpieces *c* are open and are sealed by water

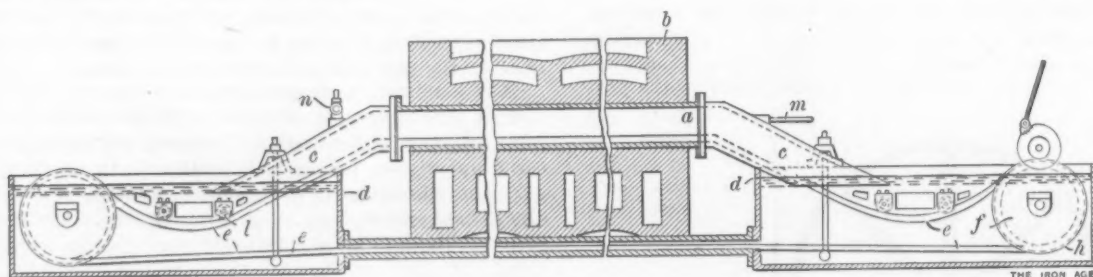


Fig. 1.—Longitudinal Section through Bates-Peard Continuous Annealing Furnace for Nonferrous Metals.

sure into the pot in the heating as well as the cooling process. But the labor involved in the packing of the metals to be annealed and the filling of boxes with sand, scale or charcoal is a considerable factor in the cost, as is the transporting of the pots and boxes to the furnace and the heating up of a considerable mass of foreign material. The gauging of heat also involves some difficulties, though modern pyrometry has been of great help here. The liability to premature opening of the receptacle is another drawback, and it is not uncommon to find a portion of the contents insufficiently annealed, requiring for such articles a repetition of the process.

The method of annealing devised by the Bates &

Peard Patent Annealing Furnace Company, Liverpool, England, for non-ferrous metals dispenses with pickling or other cleaning and provides for annealing without oxides or scale, at the same time automatically conveying the material into and out of the furnace. Besides this saving of the labor ordinarily required in connection with annealing the process economizes heat, as only the article to be annealed is heated up. The process employs an air tight chamber or tube, incased in a heating furnace fired by gas, oil or coal. The annealing tube de-

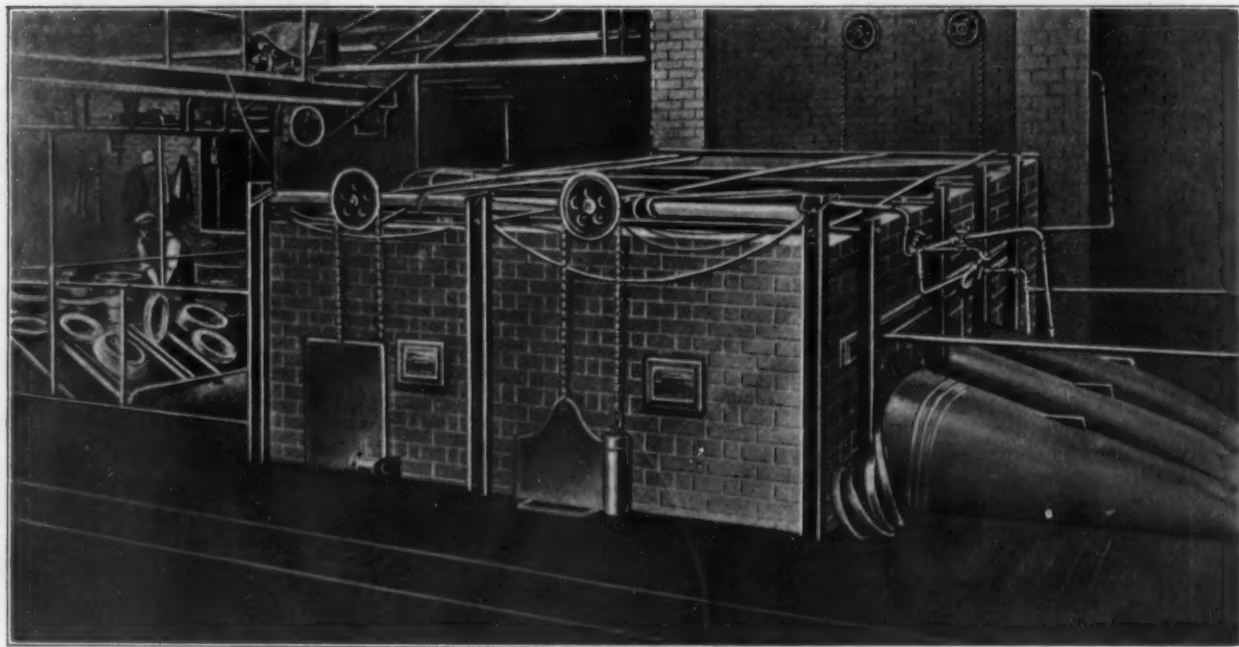


Fig. 2.—Body Portion of Three-Tube Wire Annealing Machine.

Peard Patent Annealing Furnace Company, Liverpool, England, for non-ferrous metals dispenses with pickling or other cleaning and provides for annealing without oxides or scale, at the same time automatically conveying the material into and out of the furnace. Besides this saving of the labor ordinarily required in connection with annealing the process economizes heat, as only the article to be annealed is heated up. The process employs an air tight chamber or tube, incased in a heating furnace fired by gas, oil or coal. The annealing tube de-

roller. On starting up steam or gas is blown in at one end of the retort to drive out any air which may remain in erecting the furnace. For this purpose pipes *m* and *n* are used.

Fig. 2 represents a large three-tube furnace used for the annealing of wire. Such a furnace employed in the annealing of copper for electric cable making has had an output of as high as 50 tons a day. It is operated by two men, one taking care of the metal and another stoking the furnace and wheeling away ashes. Fig. 3 illus-

trates a furnace designed to fill the needs of works having a small output or at which coal firing is not practicable. It is heated by gas, and can be placed in any convenient position in the works adjoining the space where annealing is required.

Charles M. Dally, 29 Broadway, New York, represents the Bates & Peard annealing furnace for non-ferrous metals in the United States and Canada. Arrangements

falling automatically and closing the chute when the metal passes it. The material slides down on to the conveyor and is carried into the chamber *b'*. On the end of the outlet box *e'* is another conveyor *k'*, which receives the metal as it is delivered from the end of the main conveyor. The second conveyor works in the casing *l'*, in passing through which the metal becomes cool. Air may be blown onto the surface of the casing *l'*, or water

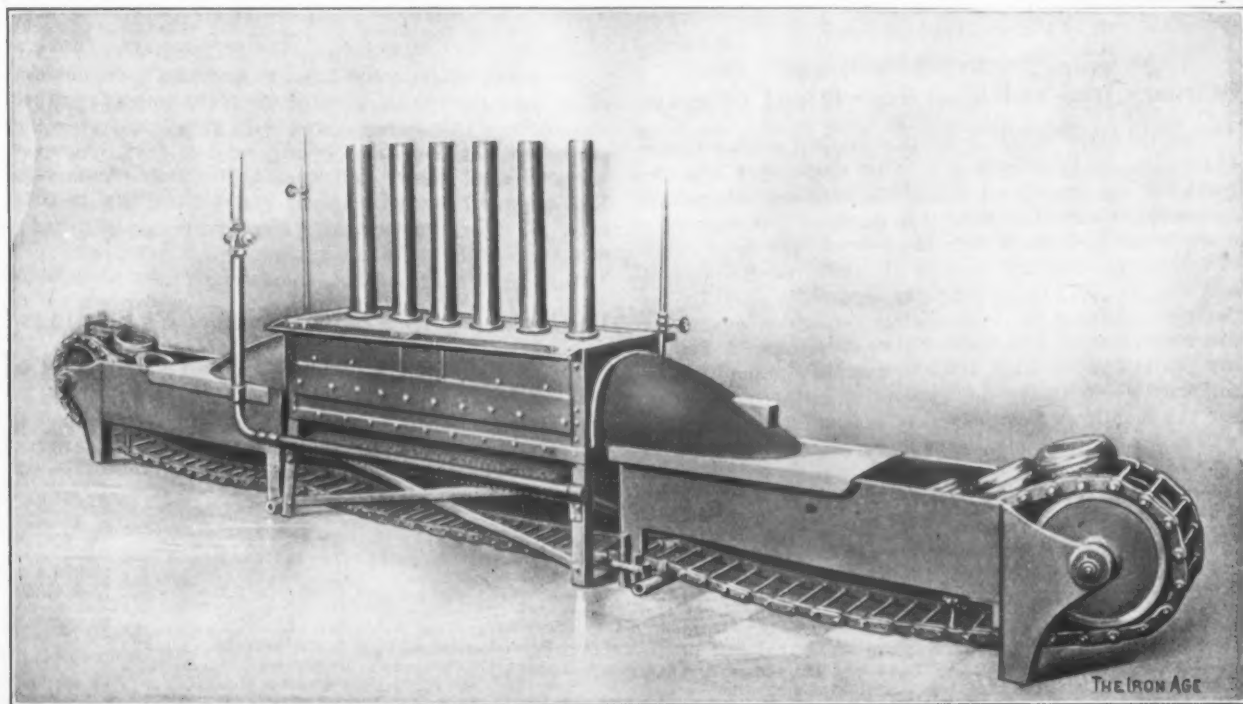


Fig. 3.—Single Tube Gas Fired Furnace for Annealing Fine Wire.

have been completed for installing this furnace at an important Eastern plant for annealing wires other than steel, and it is now in use at a wire plant in Canada.

Automatic Annealing of Iron and Steel.

The difficulty in annealing iron and steel by the process described above was the fact that when iron is heated to redness in the presence of steam the steam is decomposed, the hydrogen being given off, while the oxygen attacks the iron, forming a thin coat of black oxide. In the case of steel above a certain carbon content its passage through the water seal at the discharge end of the annealing chamber would tend to harden it again. To meet this difficulty it was necessary to provide a substitute for the water seal, while at the same time retaining the con-

veyer. The metal is discharged down the chute *m'*, the lower end of which has a hinged flap or door which will be opened by the metal as it falls down. The door afterward closes automatically by its own weight.

A nonoxidizing atmosphere is retained within the chamber, the inclosing boxes, the casing and the inlet and outlet chutes, by introducing gas under a slight pressure above that of the atmosphere, coal gas, for example, through the inlet pipe *o'*. A small and constant escape is provided through the pipe *p'*. By maintaining a slight pressure above the outside atmosphere the air without cannot get in when the inlet and outlet doors are open, and only a slight escape of gas takes place.

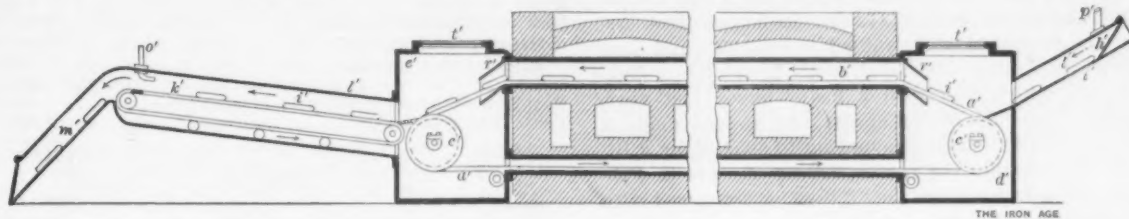


Fig. 4.—Longitudinal Section through Furnace for Annealing Iron and Steel Products.

veyor. Bates & Peard have, therefore, designed a furnace of which a longitudinal section is shown in Fig. 4. The ends of the conveyor *a'*, which carries the metal articles or bundles to be annealed through the chamber *b'*, together with the drum over which the ends of the conveyor run, are inclosed in chambers *d'* and *e'*, one at each end, which are in free communication with the interior of the annealing tube. On the inlet chamber *d'* is an inclined chute down which the metal to be annealed slides. At the entrance to the chute is an inclined door hinged at its upper end. This door moves on its hinge when bundles of wire or other product are introduced,

illuminating gas, carbonic acid or other gas may be used, the choice depending upon the metal to be annealed. Instead of the hinged inlet at the doors a rotary or other mechanical closing device may be employed. Over the ends of the annealing chamber downwardly inclined screens *r'* are provided, which prevent the heat of the chamber being radiated directly to the boxes *d'* and *e'*. On the top of the boxes are covers *t'*, each having a window so that the condition of the metal underneath can be observed. The chamber is set in a brick work furnace, with a tube in its lower part to allow the return of the conveyor. Where a rotary air lock in the form of a

paddle wheel is used at the inlet and outlet it may be revolved on a shaft driven by the same mechanism which drives the main conveyor, and the gap between the blades of the wheel may be adjusted so as to suit the size of the articles to be annealed. The lock being revolved at the same rate as the travel of the conveyor feeds the article to be annealed automatically at the proper speed, and before one blade of the air lock opens into the feed chute the next is engaged with the casing of the lock, thus preventing the entrance of atmospheric air or the exit of the nonoxidizing gases.

February Iron and Steel Exports and Imports.

The February report of the Bureau of Statistics of the Department of Commerce and Labor shows that both exports and imports of iron and steel decreased that month as compared with January. The decrease was relatively much larger in imports than in exports. The total value of exports of iron and steel of all kinds, excepting iron ore, was \$12,747,343 in February, against \$12,980,736 in January. Taking the commodities for which quantities are given, the exports were 97,719 gross tons in February, as compared with 109,506 tons in January. The following table shows the exports of such commodities for the month of February this year and last year, as well as for the eight months ending with February:

Commodities.	February.		Eight months.	
	1906.	1905.	1906.	1905.
Gross tons. Gross tons.				
Pig iron.....	6,934	7,614	31,283	45,384
Scrap	374	787	7,167	16,926
Bar iron.....	3,645	2,021	22,045	21,823
Wire rods.....	348	....	3,623	16,864
Steel bars.....	2,004	2,449	12,655	16,558
Billets, ingots, blooms.....	21,912	14,481	184,365	165,618
Hoop, band, scroll....	174	505	3,972	2,392
Iron rails.....	....	4	....	31
Steel rails.....	24,017	22,211	221,748	314,948
Iron sheets and plates	897	475	6,421	3,090
Steel sheets and plates	4,507	655	43,930	40,986
Tin plates andterne plates	1,068	149	3,946	5,148
Structural iron and steel	5,479	8,651	56,276	46,742
Wire	13,204	6,597	99,336	74,065
Cut nails.....	539	432	4,659	5,408
Wire nails.....	4,810	2,343	26,137	22,822
All other nails, including tacks.....	102	79	2,612	1,169
Pipes and fittings*....	7,705	....	51,050	....
Totals.....	97,719	69,453	781,225	799,970

* Quantity not stated prior to July 1, 1905.

Some of the details of February exports are interesting. For instance, the exports of steel rails were largest to South America, which took 16,740 tons, or two-thirds of the entire rail exports. In electrical machinery Cuba was the largest customer, taking \$135,218 worth; British North America came next, with \$128,322, and the United Kingdom was third, with \$117,393. In locomotives Argentina was first, taking 11, valued at \$142,165, and Central American States came next, with 7, valued at \$86,300. Japan, which was such a heavy buyer last year, took none. The exports of stoves and ranges made a good showing in February, amounting to \$65,016, or a little more than double the corresponding exports in February of last year, but even they fell off as compared with January with its \$103,668.

The total value of the imports of iron and steel of all kinds, excluding iron ore, was \$1,875,173 in February, against \$2,425,017 in January. Taking the commodities for which quantities are given the total exports for February were 28,407 gross tons, as compared with 46,516 tons in January. The following table shows the imports of such commodities for the month of February this year and last year, as well as for the eight months ending with February:

Commodities.	February.		Eight months.	
	1906.	1905.	1906.	1905.
Gross tons. Gross tons.				
Pig iron.....	14,972	10,834	165,606	55,126
Scrap	2,599	1,153	21,988	7,404
Bar iron.....	3,586	3,581	29,713	16,319
Rails	331	....	8,434	7,996

Hoop, band and scroll	283	22	4,742	1,583
Billets, slabs, bars, &c., steel in forms n.e.s.	1,229	809	12,710	6,366
Sheets and plates....	358	112	1,773	1,355
Tin plates andterne plates	2,037	5,194	34,950	48,981
Wire rods.....	1,257	1,163	12,474	9,813
Wire and articles made from	196	254	2,454	2,318
Structural iron and steel	1,529	32	20,254	1,870
Chains	13	11	180	200
Anvils	17	11	137	98
Totals.....	28,407	23,176	315,415	159,429

As compared with the January movement, the imports of pig iron showed the greatest decrease, but as to other commodities the decrease was well distributed over the entire list. It is perhaps worthy of note that structural iron and steel imports fell from 3978 tons in January to 1529 tons in February, and tin plates from 3200 to 2037 tons. Iron ore imports in February were 84,401 tons, against 97,617 tons in January.

The Colorado Fuel & Iron Company's Earnings.

A statement of the earnings of the Colorado Fuel & Iron Company for the eight months ended February 28 last has been issued. The income account is as follows:

Gross	\$14,470,688
Expenses and management.....	12,734,841
Net earnings.....	\$1,735,847
Add: Income from securities.....	285,472
Interest and exchange.....	35,558
Total net.....	\$2,056,877
Deduct: Fixed charges and taxes.....	810,822
Surplus.....	\$1,246,055
Less: Provision for sinking funds, rentals (Colorado Industrial Company's properties), excess cost ore, etc.....	1,021,554
Surplus for eight months ending February 28....	\$224,501

This company also is contingently liable on its guarantee of the principal and interest of the bonds of the Colorado Industrial Company outstanding under its mortgage of August 1, 1904, and as the owner of all the stock of the Colorado company is beneficially entitled to the equity in that company's property above the amount of bonds outstanding.

The balance sheet of the corporation of February 28 is as follows:

Assets.	
Real estate.....	\$14,851,768
Equipment—Iron department.....	23,281,983
Water supply.....	839,220
Equipment—Miscellaneous	394,121
Property account (Colorado Industrial Company)...	586,279
Cash on hand.....	708,128
Securities—Stocks and bonds.....	6,950,024
Bills receivable.....	88,955
Customers and others.....	1,748,643
Miscellaneous	237,000
Rocky Mountain Coal & Iron Company.....	113,408
Iron department—Supplies.....	1,207,336
Manufactured stocks.....	1,801,096
Miscellaneous accounts.....	88,595
Industrial department—Supplies.....	301,477
Royalties on leased lands paid in advance—Ind....	99,343
Profit and loss deficit.....	1,070,137
Total.....	\$54,966,388
Liabilities.	
Common stock.....	\$30,132,000
Preferred stock.....	2,000,000
Total funded debt.....	19,979,000
Unpaid general vouchers.....	336,296
Unpaid pay and time checks.....	545,170
Colorado Supply Company.....	115,000
Miscellaneous	272,358
Fund for payment of taxes.....	100,000
Colorado & Wyoming Railway Company.....	309,552
Total provisional accounts.....	1,176,708
Total.....	\$54,966,388

Herr Ballin, director of the Hamburg-American Steamship Company, at a general meeting of the stockholders held in Hamburg, March 30, said that British turbine steamers had not attained results regarding speed or the consumption of coal which justified their adoption by his company in the immediate future. The experiments with turbines, however, would be continued.

Freight Classification of Scrap.

WASHINGTON, D. C., April 3, 1906.—The Interstate Commerce Commission has promulgated a decision with regard to the application of the freight classification for scrap iron and steel to articles which may or may not be capable of further use for the purpose for which they were originally manufactured. The case has arisen upon a complaint of the National Machinery & Wrecking Company against a number of railroads for levying upon an old electric dynamo, invoiced as a box of scrap iron, the rate provided by the classification for new dynamos. The tariff sheet of the carrier receiving the shipment showed a rate of \$1.33 from Marietta to Cleveland on electric dynamos, while that on scrap iron was 65 cents per 100 pounds. The consignee, the complainant in this proceeding, paid the freight charge of \$83.79 under protest and filed a complaint with the commission to recover the difference between this sum and that which would have been charged had the shipment been classified as scrap iron.

The evidence showed that the dynamo had burned out and was worthless as a dynamo, and that it was the intention of the consignee upon receiving it to separate the brass and copper from the iron and sell the salvage for junk. The iron which it contained would be worth about 1¼ cents per pound and the brass and copper about 14½ cents. The evidence also showed that second-hand dynamos are extensively dealt in at the present time, being repaired and afterward used for the generation of electric currents, but it appeared that a much larger business is done by another class of dealers who buy old dynamos for the purpose of scrapping them. In sustaining the classification of the carrier in this instance the commission suggests the modification of the classification rules in such a manner as to permit the shipment of articles having no further value as such as junk without regard to their form or condition, and the testimony of the agents of the defendant railroads is quoted to show how such rates may be secured in many instances. The conclusions of the commission are presented as follows:

Ruling of the Commission.

Two questions seem to be presented by this record. First, should the rate on second-hand dynamos be less than that on new dynamos? Second, should the rate on dynamos, when they are only valuable as junk, be the same as on new dynamos?

We know of no instance where the rate on second-hand articles, as such, is less than the rate on the new article. There are cases where a lower rate is imposed when a machine is returned for repairs than would be imposed upon a single movement of the machine. The Western Classification provides that when goods which have been shipped to a given destination are for any reason returned, a rate one-half the going rate shall be applied. Under the Official Classification shipments of household furniture, when released to the value of \$5 per 100 pounds, take a first-class rate, as against a rate of one and a half times first class when not so released. These instances, and others which might be cited, recognize to an extent the principle that the condition and value of the property may properly be taken into account in determining the classification.

It may also be noted that in the business of handling these second-hand dynamos, the dynamo when shipped from the electric light station to the factory is in the nature of a raw material which is to be converted into a manufactured product. Its value is very much less than that of a new dynamo, and that value depends largely upon the freight rate. In the case before us the complainant paid \$85 for this machine and was charged \$83.79 for its transportation to Cleveland. Much might be said in favor of a rule which would apply a lower rate to second-hand dynamos when shipped from the electric light station to the repair shop than is charged upon either a new or second-hand dynamo when sent to the station for use; but that is a question of policy for the railroads themselves. This commission cannot say that it is unjust or unreasonable to require the same charge for the transportation of the new and the second-hand dynamo.

The second question is an entirely different one. The dynamo is no longer valuable as such; it has ceased to be an electric machine and has become a combination of copper, brass and iron scrap. Should the same rating be applied to this as to the dynamo?

Under the Official Classification many iron articles in less than carload lots are rated as third class. Most kinds of machinery are second class. Dynamos are first class. As-

suming, without expressing any opinion upon that subject, that this rating of dynamos is just and reasonable, it must be upon the ground that the dynamo is a valuable and delicate piece of mechanism which can afford to pay a high rate of carriage and which requires great care in handling. Neither of these things can be affirmed of that dynamo when it has become junk. Its value is no greater than the selling price by the pound of the metal which it contains, nor indeed as great, since a certain amount of labor must be expended before even that price can be obtained. It is apparent that there ought to be some way in which this scrap can be shipped at a less rate than would be applied to the dynamo.

Rates on Scrap.

The railroad witnesses state that this can be done; that the tariffs provide a fourth class rate upon iron scrap and a third class rate upon copper and brass scrap; but they further state that in order to obtain this rate the scrap must be presented for shipment in boxes or barrels. In other words, this dynamo must have been broken up at Marietta before it was offered for shipment. The application of such a rule would have prevented the complainant from handling this dynamo or from doing a similar business at other points, and we see no good reason for its enforcement. It was said by the same railroad witnesses that a steam engine, or the fly wheel of an engine, or a steam boiler might be shipped at the scrap rate without being broken in pieces, provided it was manifestly of no further use for its original purpose. In the same way, we think that it should be possible to ship as junk a dynamo which has been bought for that purpose and which has actually no other value. Such a dynamo need not be boxed nor otherwise prepared for shipment, and it should, of course, bear the rate applicable to the highest class metal used in its construction.

The defendants insist that the application of such a rule would open the door to fraud, and that dynamos which were in fact intended to be repaired and resold as second-hand dynamos would be shipped as scrap. While this objection has some force, we do not regard it as controlling. First, while it is true that railroads are forced to continually guard against misdescriptions of property, we still think that something should be left, in dealing between the carrier and the public, to the good faith of both parties. Second, a dynamo is a delicate piece of mechanism which requires ordinarily careful preparation for its safe transportation by rail. Few shippers would venture to offer a dynamo of much value without such preparation, since the railroad would be absolved from all care in its carriage. Third, the railroad has it in its power to make sure of the good faith of the shipper by requiring the dynamo to be mutilated before leaving the hands of the delivering carrier at destination. It appeared from the testimony that this requirement had on several occasions been imposed upon complainant as a condition of obtaining the scrap rate upon its shipment. Perhaps this might be done before delivery for shipment.

Dynamo Rate Properly Levied.

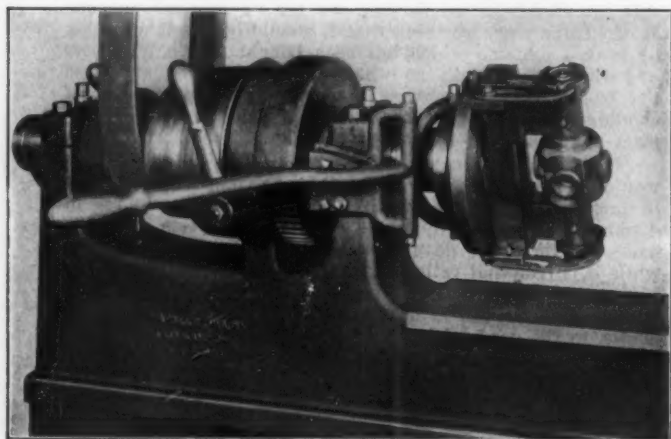
The shipment in question was boxed as a dynamo, and was, as far as could be seen by external inspection, in fact a dynamo. It was described by the Marietta Electric Light Company as "scrap iron," but that company understood that the machine was in fact bought by the complainant as a second-hand dynamo, and that this description was intended to secure a lower rate of freight. Under the circumstances, we think that the defendants were justified in applying to it the dynamo rate, and this complaint will be dismissed; but we also feel that the rules of the carriers should be so modified that the complainant could, had it elected, have shipped this dynamo for what it in fact was, namely, junk. We do not attempt to make any order, for we have no authority to do so, but call this to the attention of the defendants in the hope that they may give it consideration. W. L. C.

The Hendrik Hudson, the largest river steamboat in the world, was launched March 31 at the yard of the T. S. Marvel Shipbuilding Company, Newburg, N. Y. The boat will have accommodations for 5000 passengers. The general dimensions are as follows: Length over all, 390 feet; breadth of hull (molded at deck), 43 feet; breadth over guards (molded), 82 feet; depth, 14 feet 4 inches; draft, 8 feet. Seven steel bulkheads will make the boat practically unsinkable, and the inclosures around the boilers will be of heavy steel plating, eliminating all danger of fire. The engines, which are of the inclined type, will develop 6000 horse-power and will drive the 29-foot paddles at the rate of 40 revolutions per minute, or 23 to 25 miles per hour. The new boat will be placed on the Albany-New York run next August by the Hudson River Day Line.

The Pinkerton Automatic Revolving Jaw Chuck.

An automatic revolving jaw chuck, adapted for use on screw and automatic machines and turret lathes, has recently been patented by the Pinkerton Mfg. Company, 2631 North Thirty-fourth street, Philadelphia, Pa. It is particularly useful for finishing globe valves, gas cocks, elbows, tees, exhaust valves, bicycle and automobile parts, &c. The device is attached to a lathe or machine in the same manner as an ordinary chuck, and has a face plate with T-slots, into which the supports of the chuck are inserted. The heads or jaws for holding the work have long trunnions fitted with ball bearings to render manipulation easy.

The rotary motion for indexing the work is given by cam actuated pawls engaging teeth in ratchets on the ends of the trunnions, this movement being controlled by a hand lever attached to the head stock of the machine, as shown in the illustration. A pin, held in position by a spring, locks the chuck in any of its four positions. One-quarter, one-half, three-quarters or a full revolution, either forward or backward, may be obtained



The New Automatic Revolving Jaw Chuck of the Pinkerton Mfg. Company, Philadelphia.

with one motion of the lever, there being no idle moves necessary, and from one to four faces can be finished without rechucking or stopping the machine.

The chuck is now being made in two sizes, the smaller taking from $\frac{1}{4}$ to 1 inch work and the larger from 1 to 2 inch work, the swing being up to 5 inches in the smaller and 7 inches in the larger size. The body of the chuck is of cast steel, all wearing parts of tool steel and the parts most likely to break are of machinery steel, case hardened. It is claimed that the device will accomplish a material saving of labor over the old methods of boring, tapping, facing, &c.

The Scherzer Rolling Lift Bridge.

A statement just issued by the Scherzer Rolling Lift Bridge Company, Monadnock Block, Chicago, gives much information regarding contracts taken for Scherzer bridges, both at home and abroad. With this modern type of movable bridge any number of parallel tracks can be added from time to time to meet the expanding requirements of traffic without interfering with or disturbing the existing Scherzer bridge or traffic thereon, consequently saving large sums of money and expediting traffic with increased safety. One of the inherent limitations of the center pier swing bridge is the fact that it cannot be enlarged or widened to accommodate additional tracks. It must always be discarded and removed at a great loss and also disarranging traffic, for if a new swing bridge were constructed alongside of an existing swing bridge it would be impossible to operate either of them because they would interfere with each other. This fact has inured greatly to the advantage of the Scherzer bridge. Following are some of the details showing how the bridge is winning favor abroad:

The Scherzer bridge constructed across the Suir River,

Ireland, for the Fishguard & Rosslare Railway has been completed. The new bridge is intended to facilitate the traffic of this modern high speed line, which has been constructed to shorten the time and distance between Queenstown, Cork and the south of Ireland and London. The Scherzer bridge constructed across the Swale River for the Southeastern & Chatham Railway on the fast mail route to the Continent has been so rapid in operation and satisfactory that it has induced the Dutch Railroad Company to adopt a three-track Scherzer bridge, now under construction across the Haarlem River on its main line fast mail route. The traffic of the Buenos Ayres Great Southern Railroad has expanded so as to require a double-track line. This company is removing its single-track bridge across the Riachuelo River and replacing it with a modern double-track Scherzer bridge.

In addition to the very large number of railroad Scherzer bridges constructed and in successful operation for the principal railroad companies in the United States and abroad, more than 40 electric railroad and highway bridges of this type have been constructed and placed under construction. The records of the company include the largest and most important movable bridges constructed throughout the world during the past ten years.

Coal and Coke Exports in 1905.

The coal and coke exports of the United States in the calendar year 1905 reached a total of nearly 9,800,000 gross tons, valued at more than \$31,000,000. The exports of anthracite coal were 2,229,983 tons, valued at \$11,104,654; of bituminous coal, 6,959,265 tons, valued at \$17,867,964; of coke, 599,054 tons, valued at \$2,243,010. Almost all the exports of anthracite coal were to Canada, and over two-thirds of the exports of bituminous coal. The table below shows the export movement in 1905 as compared with 1904 and 1903 and the countries to which coal was exported:

	1905.	1904.	1903.
British North America, anthracite.	2,187,450	2,193,746	1,983,562
Bituminous	4,777,180	4,384,208	4,552,301
Mexico, anthracite.....	1,385	789	815
Bituminous	925,785	879,958	845,597
Cuba, anthracite.....	29,035	25,030	18,476
Bituminous	535,350	494,197	421,283
Other West Indies and Bermuda:			
Anthracite	9,239	6,476	4,327
Bituminous	291,537	247,109	216,169
Italy, anthracite.....	5	728	1
Bituminous	68,364	69,202	49,219
Other Europe, anthracite.....	382	33	10
Bituminous	32,526	74,391	35,959
Other countries, anthracite.....	2,487	1,590	1,666
Bituminous	328,523	196,061	182,713
Totals.....	9,189,248	8,573,518	8,312,098
Coke	599,054	523,090	416,385

The exports of coal from the United States have practically doubled since 1895. The distribution of coke exports is not given in the Government statistics, but such shipments are largely to Mexico. Great Britain exports about five times as much coal and Germany about twice as much as the United States.

The American Electrochemical Society.—This society will hold its annual meeting at Ithaca, N. Y., May 1 to 3. The afternoons will be devoted to the reading and discussion of papers. On Tuesday evening the retiring president will deliver his address and a smoker will be given at the Town and Gown Club. On Wednesday afternoon visits will be made to the filtration plant, hydraulic laboratory, power plant and Ithaca Gun Company. Wednesday evening will be given over to a subscription dinner. On Thursday afternoon a visit will be made to the Remington Salt Company and perhaps to the Morse Chain Works. Among the papers to be presented are the following: John Nelson, "Effect of Oxides on the Adhesiveness of Electrodeposited Metals"; F. F. Colcord, "Impurities in Electrolytic Copper"; A. Van Winkle, "Electroplating"; B. E. Curry, "Electrolytic Corrosion of Copper-Tin Alloys"; C. F. Burgess and S. G. Engle, "Observations on the Corrosion of Iron by Acids"; Isaac Adams, "Development of the Nickel-plating Industry"; W. C. Arsem, "The Electric Vacuum Furnace"; O. P. Watts, "A New Silicide of Molybdenum"; B. E. Curry, "Electrodeposition of Bronze."

The Hill Taper Milling Dog.

For taper milling work, such as the fluting of reamers, a difficulty has been the obtaining of a dog for holding the work on the centers from rotation with respect to the dividing head. As the tail of the dog constantly changes its angle in relation to the driver on the spindle of the dividing head, there is a tendency for the dog to get loose in the driver and spoil the work. Another tendency is that the work may be bent or sprung on the centers because of the set screw usually employed being too high or too low on the tail of the dog. With the usual arrangement the set screw holding the dog in the driver has to be loosened and tightened every time the work is indexed.

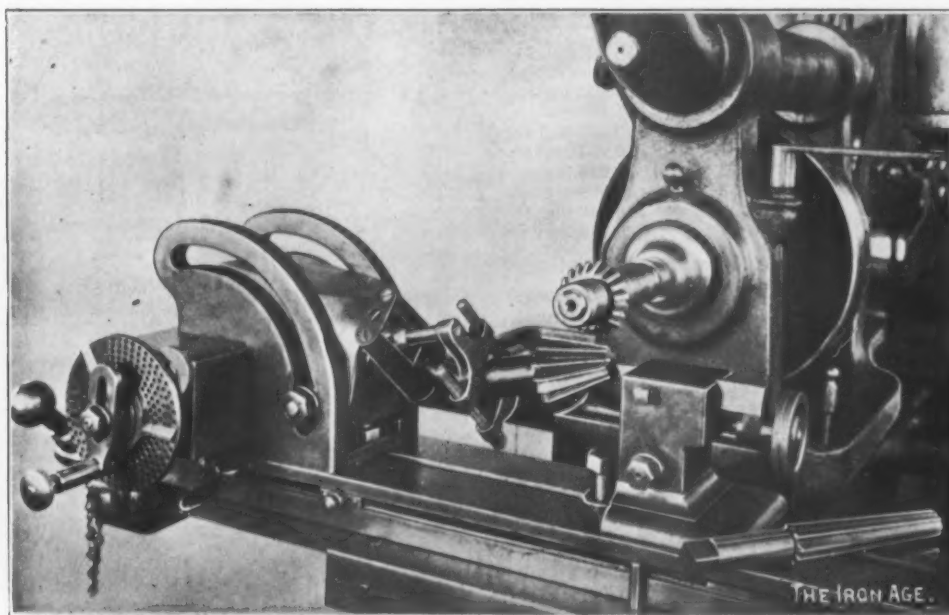
In the dog shown in the illustration, the inventor, M. B. Hill, Worcester, Mass., does away with the set screw. The tail of the dog is held in a ball sliding in an annular groove. The ball is fitted to the groove, and the tail of the dog is ground and lapped to make a gauge fit in the ball. Both ball and tail are hardened. Thus the tail of

per sulphate for one minute and then removed, immediately washed in water thoroughly and wiped dry. This process shall be repeated. If after the fourth immersion there is a copper colored deposit on the sample or the zinc has been removed the lot from which the sample was taken shall be rejected. The standard solution of copper sulphate shall consist of a solution of 34.5 parts of crystallized copper sulphate in 100 parts of water. This solution will have a specific gravity of 1.185 at 70 degrees F. While a sample is being tested the temperature of the standard solution shall at no time be less than 60 degrees F. nor more than 70 degrees F."

Color Carbon Estimation and the Influence of Copper.

BY G. B. WATERHOUSE, BUFFALO, N. Y.

The importance of the color method of estimating carbon is almost incalculable. Its rapid and in most



A Dog for Holding Taper Work in a Miller, Made by the Novelty Mfg. Company, Worcester, Mass.

the dog can move automatically with the indexing and there is no lost motion. After the work has been placed on centers and the dog tightened no further attention need be given it until the operation has been completed. The appliance will space evenly on the quarters, but not between these points. This unevenness is about that required on reamers and similar tools to prevent chattering. The device is furnished with a 2-inch clamp dog, or if desired with a set of three dogs, 1, 1½ and 2 inch. It is manufactured by the Novelty Mfg. Company, Worcester, Mass., of which M. B. Hill is the manager. The illustration shows the device used in about the most exaggerated position that it would ever be called upon to occupy. The reamer shown on the bed of the machine represents the average work which the dog is used for.

Dating Nails for Railroad Ties.—At the annual meeting of the American Railway Engineering and Maintenance of Way Association in Chicago, March 20-22, 1906, the report of the Committee on Ties presented at the meeting of 1905 was adopted with some amendments. The portion relating to the specifications for dating nails is as follows: "The nail shall be ¼ inch in diameter, 2½ inches in length, with head ⅝ inch in diameter, having stamped therein two figures designating the year; the figures to be ⅝ inch in length and depressed into the head 1-16 inch, made of iron or steel, galvanized with a coating of zinc, evenly and uniformly applied so that it will adhere firmly to the surface of the steel. Any specimen shall be capable of withstanding the following test: The sample shall be immersed in a standard solution of cop-

per accurate analysis of a steel has contributed in no small measure to the great advances in iron and steel production during the last few decades. Eggertz, the inventor of the process, in the *Chemical News*, Vol. 44, page 173, makes a comprehensive statement in its favor. He says: "Likely amounts of manganese, phosphorus, silicon, sulphur, tungsten, chromium, vanadium, nickel, cobalt and copper are without influence."

Experience has taught us, however, that this requires to be modified. Professor Arnold in his book, "Steel Works Analysis," speaks of steels for which the color test is not available. He says that these comprise steels containing large percentages of elements yielding colored solutions with nitric acid, such as chromium, copper and nickel, but particularly chromium. A. A. Blair, in his well-known book, also states that "the only elements that seem to have any decided effect on the color of the nitric acid solution are copper, cobalt and nickel."

Apart from the influence of these elements it is now known that the accuracy of the method lies within fairly well defined limits. The process of manufacture has an effect on the color. Steels made in the crucible should only be compared with crucible steel standards, and open hearth or Bessemer steels with open hearth and Bessemer steels, respectively. Still further, the color varies with the form in which the carbon exists in the steel, and this in its turn depends on the treatment the steel has undergone. With hardened steels or steels hardened and tempered the results are low because the so-called hardening carbon only gives a very faint color with nitric acid.

The present condition of our knowledge is that to obtain accurate results the standard and the steel should be of about the same composition; and down to being placed in the comparing tubes their history and treatment should be, as far as possible, identical.

Some experiments have been done with regard to finding the effect of copper on the color carbon estimation. Six rail steels were worked on in which the copper varied from 0.0 to 0.864 per cent. They had undergone like treatment, having been made by the same process and rolled in the same mill under similar conditions. To escape the danger of segregated areas drillings were taken in each case from the center of the left half of the head. Their composition, with the exception of carbon, is given in the following table of percentages:

No.	Silicon.	Sulphur.	Phosphorus.	Manganese.	Copper.
1.....	0.145	0.045	0.106	1.05	None.
2.....	0.117	0.095	0.100	0.93	0.067
3.....	0.103	0.075	0.090	0.94	0.279
4.....	0.145	0.091	0.088	0.99	0.334
5.....	0.117	0.102	0.087	0.78	0.550
6.....	0.110	0.109	0.075	1.12	0.864

Combustion and color carbons were carefully done, and the following results obtained:

No.	Combustion Per cent.	Color with ordinary standard. Per cent.	Variation of color from combustion. Per cent.
1.....	0.542	0.574	0.032 higher.
2.....	0.560	0.597	0.037 higher.
3.....	0.495	0.513	0.018 higher.
4.....	0.527	0.555	0.028 higher.
5.....	0.452	0.495	0.043 higher.
6.....	0.552	0.504	0.048 lower.

The standard used in this case was the usual one taken for the small test ingots caught in the Bessemer steel works, and was itself drilled from such an ingot. It was felt that the difference between the standard and the steels, which latter had been worked, might have an effect on the results. To obviate this drillings from No. 1, which contains no copper, were taken as the standard. The results then came as follows:

No.	Combustion. Per cent.	Color with No. 1 as standard. Per cent.	Variation of color from combustion. Per cent.
1.....	0.542	0.542	None.
2.....	0.560	0.563	0.003 higher.
3.....	0.495	0.484	0.009 lower.
4.....	0.527	0.524	0.003 lower.
5.....	0.452	0.467	0.015 higher.
6.....	0.552	0.475	0.077 lower.

It will be noticed that the only considerable variation is with steel No. 6 containing 0.864 per cent. copper.

From these experiments it would seem that up to at least 0.5 per cent. copper has no effect on the color estimation, but that when the copper approaches 1 per cent. it causes the results to be low.

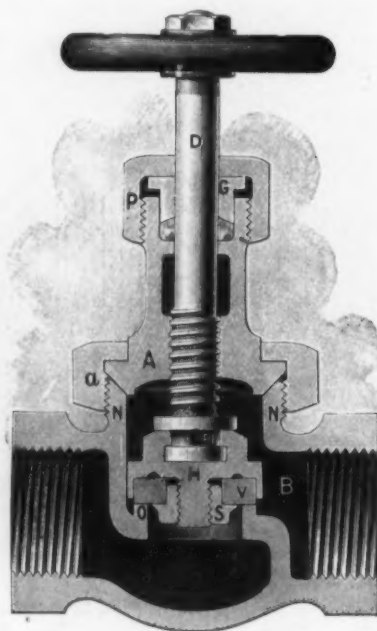
In a paper before the Cleveland (Eng.) Institution of Engineers, G. Hooghwinkel called attention to the inaction of British iron masters relative to blast furnace gas engines. In the following statement he is perhaps a little premature in his putting of the situation in the United States: "Several iron works are now using their blast furnaces for the production of the power required for their own purposes, but very few apply the power to drive either their own mills, steel works or mining plant. As far as the utilization of the surplus power outside the works is concerned, the writer does not know of a single case in Great Britain where this is carried out on a commercial scale. Ironmasters, however, possess in their surplus gases a considerable source of income for themselves and others. Foreign makers utilize more fully their surplus gases. Germany, which led the way, has now 440 blast furnace gas engines installed or ordered of a total capacity of about 320,000 horse-power. Commercial installations on broad lines may be put down without fear of failure. In the United States a start has been made for utilizing blast furnace gases in gas engines by the Lackawanna Steel Company at Buffalo, and most of the large iron works are putting down gas engines or are considering their adoption."

The Powell Union Disk Valve.

It has been the aim in the improved Union composite disk valve, made by the William Powell Company, Cincinnati, Ohio, to do away with the defects which have heretofore characterized vulcanized composite disks. The valves are intended only for moderate pressure, such as low pressure steam or hot water heating systems, and are not intended for high pressure or superheated steam. For such service the company makes the White Star valve, described in *The Iron Age* October 12, 1905.

As may be seen by the sectional engraving herewith, the improved Union valve is new in respect to several details of its design. The bonnet A has a ground joint where it is held in contact with the body neck N by the union nut a. This is claimed to eliminate the troubles caused by corrosion and the cementing of this joint, and to enable the bonnet to be removed easily at any time for repairs or inspection.

The screw stem D has double forcing collars on its lower end that engage with the upper and lower bearings of the slotted carrier H, which holds the composite disk



The Improved Union Composite Disk Valve, Made by the William Powell Company, Cincinnati, Ohio.

V. The upper collar, fitting snugly over the top flange of the carrier, holds it steady from oscillating or wobbling when the disk is being raised from or lowered upon its seat. This upper stem collar is finished on its upper face to make a steam tight joint against the lower face of the bonnet hub, so that the valve may be packed when pressure is on and the valve wide open. The disk carrier H is held by guide ribs cast in the body shell to a true axial position perpendicular to the seat at all times, insuring accurate seating of the disk in closing. For inspection, repairs or removal of the disks the carrier can be instantly and conveniently removed from the valve stem by sliding it out from between the double collars. By removing the disk carrier from its valve stem, as described, the labor of replacing a worn out disk is slight. The disks are screwed to the carrier by a strong lock nut. The packing box P on the valve stem is fitted with a driving gland, and the wheel handle is secured to the valve stem by a lock nut.

These valves are made in all sizes and styles. Those made for hot water and steam radiation particularly and may be had in sizes of from ½ inch to 2 inches. The valves are also made with iron bodies and yoke tops, in sizes of from 2 to 8 inches. The complete line of brass valves embraces globe, angle and check valves, in sizes of from ¼ inch to 3 inches.

The Standard Automatic Gear Cutter.

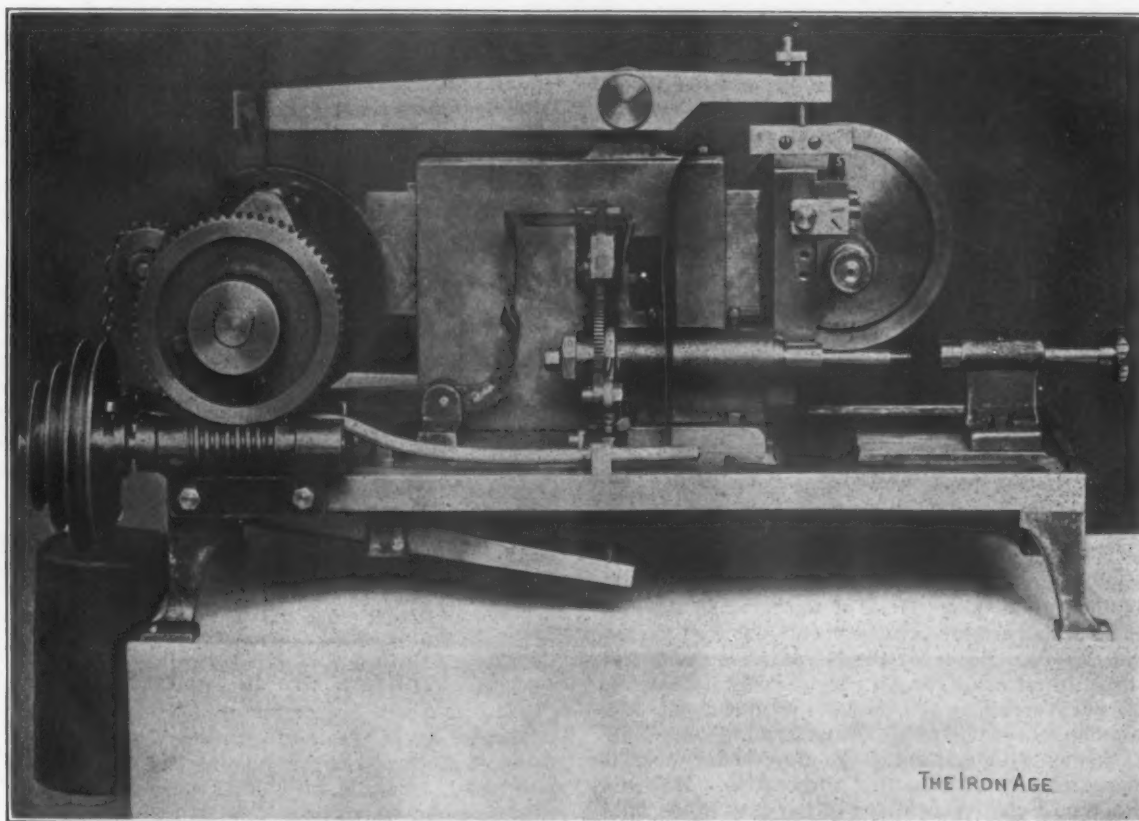
The automatic gear cutter illustrated is a bench machine intended only for small light work, but is capable of executing it rapidly. Small watch and clock pinions, parts of electrical apparatus, small bevel gear cutters and knurls of irregular shape are examples of the work it is especially designed for. Its maximum capacity is 4 inches in diameter, and it will cut teeth in blanks singly or in stacks up to 2 inches long. The builder is the Standard Mfg. Company, Bridgeport, Conn.

The machine has two distinct drives, one a two-step pulley for the cutter in the head, giving two changes of speed, and the other for the feeding, indexing and all other operations. For the feed there are nine changes, obtained through four three-step cone pulleys, two of which are on an idler intermediate shaft. The cam shaft which accomplishes the feeding, returning and indexing

contour, for which a block of proper shape may be made. The cutter spindle head may be adjusted vertically independently of the slide to suit the work.

The indexing is regulated by an adjustment on the plunger actuating the pawl. On the back of the ratchet index dial is a dog which strikes the knock-off lever at the desired point of the work, disengaging the clutch on the pulley shaft. The indexing is done and the index locked while the cutter is going back, this being accomplished in one-tenth of the time required to do the cutting. An adjusting screw brings the index dial in correct position for locking the device, this adjustment being under the pawl. There is also an adjustment so that the pawl will take one or more teeth with each indexing, according as the work may require. This adjustment is near the back of the machine and over the index lever. A pin in the index throws a catch after the work has been indexed an entire revolution and stops the machine.

Both the cutter and work spindles have taper bear-



An Automatic Gear Cutter for Small Work Built by the Standard Mfg. Company, Bridgeport, Conn.

is driven from a worm on the pulley shaft, a positive clutch being used to throw the drive out when desired. This function is automatically performed by the indexing mechanism. On the cam shaft are three cams, one operating the ram or slide carrying the cutter, another the rocking arm beneath the bed which actuates a plunger operating the pawl and ratchet indexing mechanism, and the third controlling the position of the rocker arm which holds the cutter head down. The cam for the ram motion is changed for different lengths of stroke, the maximum being 5 inches. The vertical slide carrying the cutter head is constantly tending to move upward through the action of springs, so that when released at the end of a cutting operation it is withdrawn during the indexing, and while the slide returns to start the next cutting stroke. The slide is returned by a weight when the feeding cam recedes. The rocking lever at the top of the machine at its front end carries a plug which acts against a block on the top of the head. The shape of this block determines the character of the cut with respect to its depth. Thus if the cam is flat, as in the illustration, it may be used in cutting an ordinary spur gear. If a bevel gear is required the block is replaced by one having an angle of the required degree. The cut may be of most any

ings with threaded collars for taking up wear. The machine is essentially a bench machine, but it is claimed that it will run at very high speeds without vibration or noise.

The United States Circuit Court for the Northern District of New York has filed a decree enjoining the defendant in the case of the General Electric Company vs. the Madison County Gas & Electric Company from using alternating current integrating wattmeters or other devices embodying a provision for securing an approximate 90-phase adjustment by induced circuit. The infringement which formed the basis of this suit was the using of Sheefer alternating current integrating wattmeters manufactured by the Diamond Meter Company, Peoria, Ill. This is the same patent on which E. B. Latham & Co., New York City, dealers in Sheefer wattmeters, was enjoined on November 4, 1905.

The Western Bar Iron Association, James H. Nutt secretary, Youngstown, Ohio, has asked for a separate wage conference with the Amalgamated Association.

Canada's Rail Duty.

TORONTO, March 31, 1906.—It is possible that the 50,000 tons of steel rails purchased from the United States Steel Products Export Company for delivery to the Grand Trunk Pacific Railway Company will be admitted to Canada free of duty. Application has been made by the railroad company for exemption, on the ground that the rails are unobtainable in Canada. As the rail duty was adopted for purposes of protection and not for revenue, the Government may grant the request. Half the quantity of the rails included in this order will be required to build the company's Lake Superior branch, extending from its point of junction with the main line to its terminus at Fort William, a distance of about 205 miles. Unless it were absolutely impossible to get the rails at home the company would not resort to outside markets for the rails needed on this branch. One of the conditions of the subsidy voted by the Ontario Legislature, for this branch is that the rails used upon it must be purchased in Canada. A proviso is added, however, that they must be procurable in Canada at a price not greater than the open market price in Great Britain or the United States, with the current freight rates for importation added. Thus, if the company should go abroad to get the rails for this branch when they could be bought at home, it would be liable to the forfeiture of its Ontario subsidy. That would be a very substantial loss, as the subsidy consists of cash at the rate of \$2000 per mile, and of land at the rate of 6000 acres per mile. That is to say, upward of \$400,000 and 1,200,000 acres are at stake, with the timber and mineral rights, which probably will turn out more valuable than the cash and the arable land. The company would not take the risk of this loss to satisfy a mere whim for importing rails from the United States. It evidently could not get its order filled in Canada within the present year.

Waiving of Rail Duty Probably General.

For the reason mentioned above—namely, that the rail duty was devised for protection and not for revenue, it is regarded as almost a foregone conclusion that the Dominion Government will suspend the duty on this 50,000 tons. At present the tariff law authorizes the suspension of the antidumping clause of the tariff in the case of articles which are found to be unobtainable at the moment in Canada. No doubt the Government could take upon itself to set aside the duty temporarily by order in Council, but it would be difficult so to word such an order as to confine its benefits to the Grand Trunk Pacific Railway Company without leaving the Government open to the charge of partiality to that corporation. It would seem, therefore, that the waiving of the duty would have to be general for some defined period in favor of rail imports from the United States. The privilege would doubtless have attached to it a condition something like that prescribed after the steel rail duty was promulgated. This required that only rails imported within a specified time and laid within another specified time should be admitted free after the date on which the duty was announced.

At the present time the two rail mills of Canada are turning out about 1000 tons a day, all of which is understood to be disposed of for a long period ahead. It is doubtful if this output will suffice to keep pace with the demand which has yet to be served after there has been added the 50,000 tons which the Grand Trunk Pacific Company is importing from the United States.

Railroad Building Very Active.

At the annual meeting of the Canadian Pacific Company, held in Montreal a short time ago, it was announced that the company would build about 900 miles of new track this year. The Canadian Northern Railway Company has reached Prince Albert with its northern line, and proposes to carry that on to meet its main line at Battleford. Before the present season ends it expects to have upwards of 100 miles of its line to Hudson Bay built. Numerous additions to branches are included in this summer's programme of the company. Besides its Lake Superior branch, the Grand Trunk Pacific Com-

pany is building two sections of its Western Division, making in all upwards of 1000 miles. On its part, the Dominion Government has in hand three sections of the Eastern Division. It must build the 250 miles between Winnipeg and the point of junction with the Lake Superior branch without delay. The Ontario Government will have to buy rails for nearly 100 miles of extension to its Temiskaming line. In the country traversed by that line railroad enterprise has received a strong stimulus from the wonderful mineral discoveries there. Two new companies have applied to the Dominion Parliament for charters to build lines in this tract. In both the new western provinces the legislatures have several applications for acts to incorporate companies for the building of additional lines. There is also notable activity among the builders of electric railroads.

Railroad Building Must Be Pushed.

A point which cannot be too strongly impressed with regard to most of the projected railroad building is that it must go on without delay. Population is swarming into the country from Europe and the United States, making need for railroad service in new regions. The Grand Trunk Pacific is bound by its agreement with the Dominion Government to have its Western Division completed five years from the date of its contract. It is confidently expected that the work will be finished well within that time, for the company is at least as much impelled by a desire to begin transportation operations in the West as it is by a desire to fulfill its agreement. Its energetic preparations for construction bode aggressive competition with the other lines for the carrying trade of the interior. Hence the Canadian Pacific Railway Company and the Canadian Northern Company are pushing new construction scarcely less rapidly than their prospective rival, their aim being to extend over as much of the competitive ground as possible. None of these companies will allow its hurrying work of construction to be arrested by a failure of the Canadian rail mills to provide an adequate supply of steel. They will press on the work of building their lines, no matter though every ton of rails required has to be imported with the amount of the duty added to the cost. With them the question is not the saving of duty, but the getting of the rails when they are needed.

C. A. C. J.

Wolfram Ore in Australia.

Consular Agent Weatherill supplies from Brisbane the status of the wolfram or tungsten mining industry in Queensland, Australia, of which a summary follows:

The output, which in 1901 and 1902 was only 72 and 55 tons, increased in 1904 to 1538 tons, while for 1905 the production up to September 30 amounted to 1029 tons, when the price reached \$225 per ton. The price has fluctuated greatly, having been down to a \$90 average for 1900 and 1901. It increased still more during the close of last year, going up to \$280 per ton. Such remunerative prices are greatly stimulating the industry and will make some important mining centers.

There is great need in Queensland for a cheap and effective machine to save the finer and more flaky portions of molybdenite. In dressing the ore the larger lumps of molybdenite are broken off from the attached quartz by hammer, washed and put aside for bagging. The finer stuff is screened and that remaining on the screen roughly jigged in water. The heavier lumps collect at the bottom, but the more flaky material, owing to its buoyancy in water, cannot be separated from lighter quartz. A great deal of it is wasted, as there is no sale for anything but clean mineral. The amount of this class of ore, however, does not warrant the use of expensive machinery.

The McKenna process for rerolling rails is employed at works at Seacombe, Birkenhead, England, which have attracted some attention recently. Early in March directors, chief engineers and general managers of 15 railroads were present at a demonstration of the process.

Outlook and Development in Canada.

Has the Fiscal Wind Shifted Toward Reciprocity?

TORONTO, March 31, 1906.—To the general surprise no mention was made of tariff revision in the speech from the throne at the opening of the present session of the Dominion Parliament. Sir Wilfrid Laurier's later announcement and explanation did not completely remove the perplexity. He said that the accident which laid Mr. Fielding up with a sprained ankle had obliged the Government to abandon its intention to deal with the tariff this session. Mr. Fielding being both Minister of Finance and chairman of the Tariff Commission, work on the schedules would have to stand still until he could return to his active duties. This might not be for three weeks more. Such a loss of time would push the introduction of the bill so far into the future as to render necessary a very long session if it was to be disposed of before prorogation. After the last three or four exhausting sessions it was desirable to finish up the public business this time in as few weeks as it could be crowded into. Having regard to these considerations the Government, said the Premier, thought it advisable to drop tariff revision from the programme of this session and make it the principal subject of a session to be called early in November.

In some quarters doubt was expressed that, in giving out this statement, the Government had taken the House wholly into its confidence. It was conjectured that there might be some other reason. People recalled that immediately after the accident to Mr. Fielding it was rumored that revision would have to be postponed and the rumor was understood to be authoritatively contradicted.

Fresh interest is given to the matter by the news from Washington that there have been unofficial exchanges of views between Mr. Root's department and the Ottawa Government in reference to questions which the Joint High Commission was engaged upon. Unofficial communications would mean direct communications. To give them official character they would have to pass through the British Foreign Office and the British Colonial Office. But for all practical purposes the direct relations are the ones by which understandings on such a matter as the meeting of the Joint High Commission are reached, the constitution and the limitations of that body having been arranged with Britain's concurrence. The advice from Washington was followed by the following special dispatch to the *Toronto Globe* from its Ottawa correspondent:

Washington despatches represent the Executive there as being anxious to reach a settlement on disputed matters with Canada. If the United States wants to take up the questions between itself and Canada left unsettled by the Joint High Commission the Government here will give consideration to whatever it has to say. So far no official overtures have apparently been made to Ottawa, but should they be received they will be treated with every desire to reach a settlement on the issues that are outstanding.

As the *Globe* is the leading organ of the Dominion Government the statement of its Ottawa correspondent may be taken as authoritative.

These brief intimations through the newspapers that correspondence has been passing between Washington and Ottawa and that neither Government is averse to the reopening of the negotiations which the Joint High Commission had in hand are looked upon by many as the real clue to the mystery of the change in the tariff plans of the Ottawa Cabinet. It is the expectation of those who take this view that when Parliament meets in November it will have the results of a summer's negotiations between British and Canadian plenipotentiaries on one side and American plenipotentiaries on the other to deal with and that probably one of these results will be a reciprocity arrangement more or less comprehensive.

Chances of Agreement.

Canadians who thus speculate as to the meaning of the sudden arrest of tariff revision do not necessarily impute to the Laurier Government a stronger bent toward reciprocity with the United States than it has lately professed. They simply recall that the present Ministers

were formerly ardent advocates of freer trade relations with the United States, and that it was upon Sir Wilfrid Laurier's initiative the Joint High Commission was established. It is true he has lately said that times and conditions have so far changed as to lessen greatly the importance of American trade favors as a means of furthering Canada's material development. He has also implied that it is now the turn of the United States to say the next word on the subject. But at no time has he ever expressed opposition to the idea of reciprocity between the countries.

At a party banquet given to His Honor in this city a few weeks before the opening of Parliament he referred to the readiness of his Government to make a *quid pro quo* arrangement with the Balfour Government. As the Balfour Government never went so far as to propose the adoption of a British tariff, which would be necessary in order to give Canada reciprocal exemptions, nothing came of the Laurier Government's offer. Of course, nothing of a preferential nature can come from the Campbell-Bannerman Administration, irrevocably committed, as every member of it is, to free trade. It is not impossible that the issue of the elections in the United Kingdom may have turned Sir Wilfrid's mind again toward closer relations with the United States.

It is to be recollected, too, that Mr. Fielding has given a forecast of the plan of his forthcoming tariff bill. It is to be a double-column affair at least, and probably a triple-column one. There will be duties to match those of countries discriminating against Canadian products, and there will be duties of a lower pitch for the goods of countries that are commercially more friendly. And there may also be the preferential list of duties apart from the latter. It might well be the desire of the Government to see what benefits it can expect from the United States before revealing the intentions it has toward that country.

Heralding the Steel Corporation.

It is again announced with great positiveness, though with what authority it is impossible to say, that the United States Steel Corporation will establish works in Canada. A site, it is said, has been bought, the transfer having been made last week. It is added, however, with the same confidence that the building of the works contemplated will not be finished for three or four years or perhaps a longer period. Only about \$10,000,000 of the total \$75,000,000 which the corporation is said to be preparing to spend on its plant will, according to the information that is supposed to have leaked out, be applied at first, but that sum, we are told, will be laid out without delay.

It would excite no surprise if the story turned out to be true. The frequent recurrence of rumors of this kind has at least in some measure been due to the general perception of the advantages the country seems to offer to the corporation. There is an inviting market here for its products, a market whose capacity is enlarging. The rail duty and the antidumping clause of the tariff intercepted its trade on this side. Like restrictions have caused many manufacturing concerns in the United States to establish branches here.

C. A. C. J.

The principal causes of loss in steam plants, it is said, are the use of engines which are overloaded or otherwise unsuited to the conditions of the work, undersized or badly arranged steam and exhaust pipes, and imperfect condition and poor operation of boilers. In many plants exhaust steam, which might be utilized for heating, is wasted, and in others, where it is so utilized, power is wasted by the maintenance on the system of an excessive back pressure. As all of the heat units in exhaust steam are used when the steam is condensed in a heating system this is the most economical use which can be made of it; but if the back pressure be raised excessively to force the steam through the pipes, this advantage may be lost. To obviate this a vacuum system, taking only a small amount of power for its operation, should be used to draw the steam and water through the pipes.

THE LONG ISLAND CITY POWER STATION.—I.

First Completed Step in the Pennsylvania Railroad's Extension to New York and Long Island.

For a number of years the Pennsylvania Railroad Company has been considering establishing a railroad terminal on Manhattan Island. It was originally intended to enter New York City by way of a bridge over the Hudson River, but after electric traction was found practicable for heavy train units the bridge proposition was abandoned in favor of tunnels, and the same means will ultimately connect the road with the systems of New England and Long Island. The present article describes the first unit in the construction which has been completed—namely, the Long Island City power station.

Two companies have been incorporated through which the Pennsylvania Railroad Company is carrying on its

the road, have been appointed to pass upon and work out the special problems relating to the required railroad facilities and pass upon the adequacy of the operating features, as developed by the labors of the various departmental bodies. Westinghouse, Church, Kerr & Co. have been selected as engineers and contractors for the electrical and mechanical engineering, acting under the supervision of the chief engineer of electric traction. McKim, Mead & White of New York are architects of the station building.

Location of Power Station.

To furnish the electric power for this large terminal system it was decided to erect two main generating

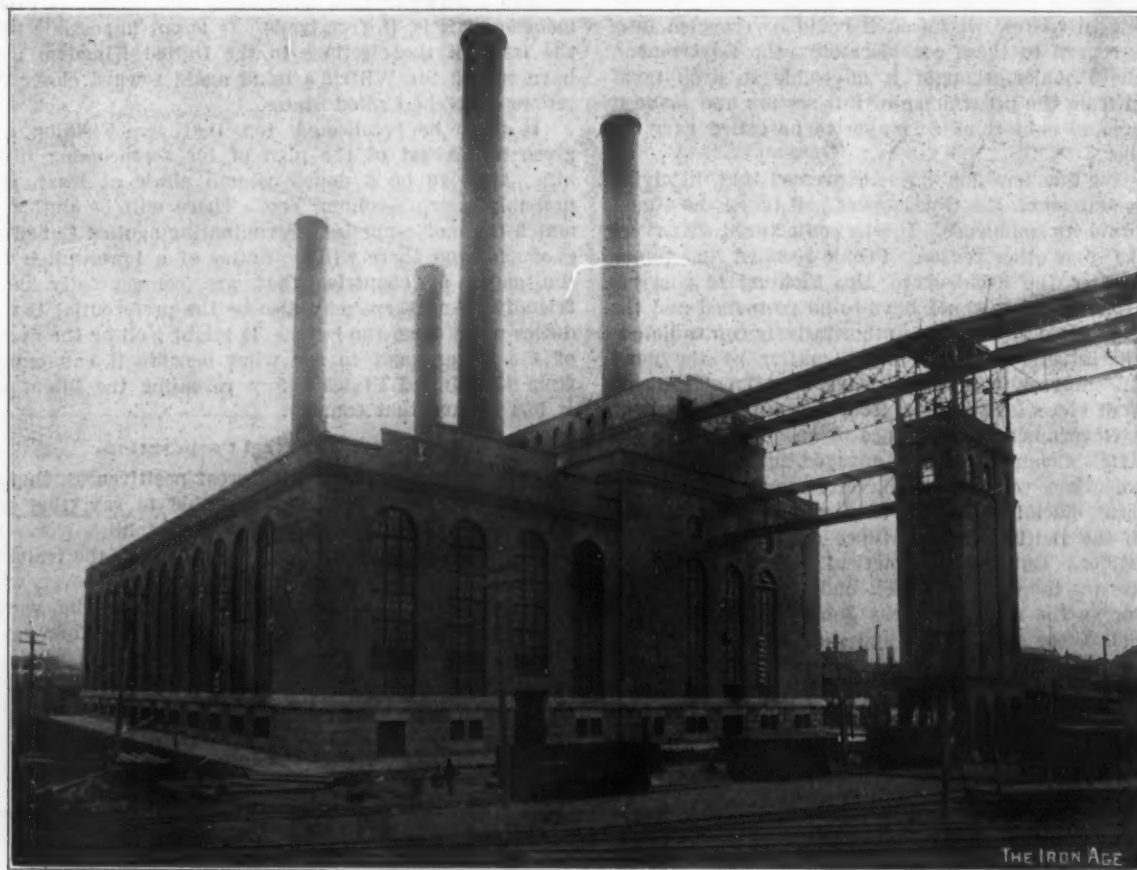


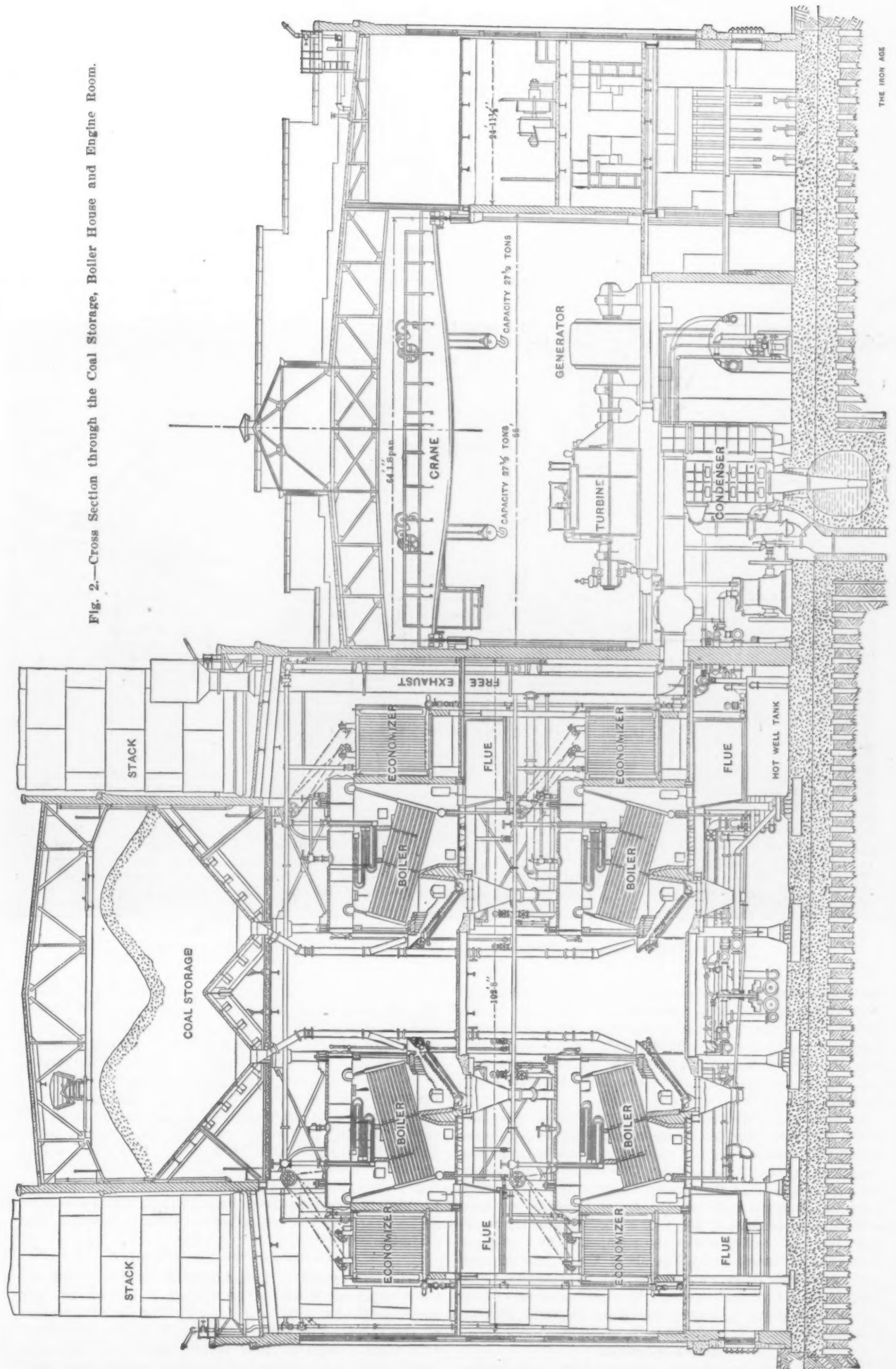
Fig. 1.—General View of the Power Station, Showing the Ash Tower and a Part of the Coal Bridge.

New York extension work. One of these, the Pennsylvania, New Jersey & New York Railroad Company, will build all that portion of the tunnel and approaches in the State of New Jersey and extending under the Hudson River to the boundary line between New Jersey and New York. From this boundary the other, the Pennsylvania, New York & Long Island Railroad Company, will construct the tunnels, terminal station and yards on **Manhattan Island**, under the East River and in Long Island City. The officers of these companies are the officers of the Pennsylvania Railroad Company, the president being A. J. Cassatt. The tunnel work proper is divided into two parts, the East River division being under the direct charge of Alfred Noble, chief engineer, and the North River division under the direct charge of Charles M. Jacobs, chief engineer. The general railroad facilities and electrical and mechanical features of the railroad and terminal are under the charge of George Gibbs, chief engineer of electric traction. These three, with Brigadier-General Charles W. Raymond, chairman, constitute a Board of Engineers, to whom the general engineering features of the whole plan are confided. In addition advisory committees, consisting of officers of

stations, one in New Jersey and the other on Long Island. The latter station would also naturally be used as the source of power for the Long Island Railroad lines as fast as equipped. Electrification of the Atlantic avenue improvement, which was impending when the general project took shape, required the early construction of the Long Island City power station. A description of the electrification of the Long Island Railroad appeared in *The Iron Age* November 2, 1905, in which some mention of this station was included and several views were shown.

The large amount of power that will ultimately be needed near the present terminus of the Long Island Railroad at Hunter's Point made it desirable to locate the power station conveniently to this district. The site chosen in Long Island City has the advantage of proximity to the East River and the additional advantage of being convenient to the Long Island Railroad freight yard, facilitating the handling of coal and ashes and the delivering of building materials and equipment during construction. The lot is 200 feet north and south on Front street and on West avenue and 500 feet deep along Third and Fourth streets.

Fig. 2.—Cross Section through the Coal Storage, Boiler House and Engine Room.



Station Capacity.

When the design was undertaken it was evident that a capacity of 50,000 kw. and probably more would be required. The largest steam turbines and generators that had been standardized were of 5500-kw. capacity and these were made the unit basis. The form of the plot makes it possible to extend at any time when it may be deemed necessary, and an ultimate capacity of 14 5500-kw. generating units, or about 105,000 electrical horse-power, will be possible.

It was decided that initially three 5500-kw. units would suffice. The building designed for this equipment covers the full width of the block and half its length, and contains room for six more units of the same size and two 2500-kw. units of the same type, to be used for lighting the tunnel.

Design of the Station.

A general exterior view of the station is given in Fig. 1. The building includes a boiler house with four independent stacks piercing the roof at regular intervals,

contents of the building except such portions of the machinery as may be more conveniently carried on separate foundations. The south wall of the boiler house supports the outer end of the boiler room roof trusses on that side of the building. In other respects the steel superstructure is independent of the building walls. The steel framing of the engine house and boiler room are necessarily different in type, as the former has to carry a double tier of boilers with flues and economizers, with a coal pocket of 5200 tons capacity on top of everything, while the engine room consists of simply a large open space which makes the roof construction the most conspicuous feature, but the size of this does not involve any difficult construction.

The steel stacks are independent of the boiler house except where they pass through the lower fire room floor, which is built against the stacks. At other points they pass through circular openings in the floor and roof, so that there is no strain upon the structure by deflection of the stack from wind stress.

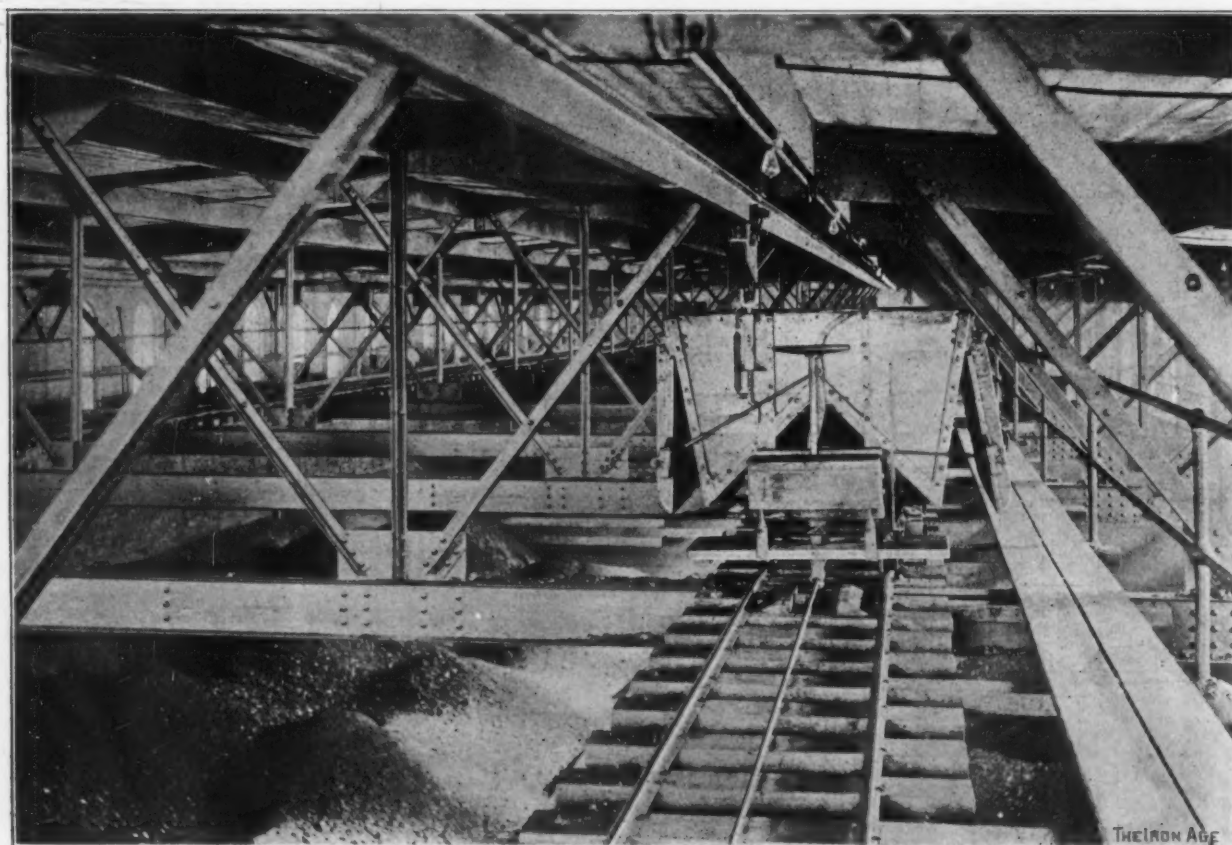


Fig. 3.—View Over the Coal Bunkers, Showing How the Coal Is Distributed by the Side Dumping Cars.

and subdivided into a series of equal bays; a coal bunker, separately inclosed and superimposed over the boiler house longitudinally between the stacks, and an engine house, including the electrical switching galleries and offices, which is a separate wing of the building connected to and parallel with the boiler house, but somewhat lower in height.

The over all dimensions of the present building are 200 x 262 feet, outside measurement. The boiler house is 103 feet wide inside, the engine house 66 feet and the electrical gallery 25 feet wide. The boiler house proper is 82 feet high to the top of the parapet. The coal pocket enclosure, superimposed on the boiler house, is 60 feet wide and its parapet is 118 feet high. The engine room is 70 feet high to the top of the parapet. The first floor of the boiler house is 16 feet above the basement, and the second floor 35 feet above the first. The engine room floor is 23 feet 6 inches above the basement, and from the vent to the roof trusses the height is about 40 feet in the clear.

Steel Construction.

The superstructure of the building is of steel frame work, which carries the weight of the roof and the entire

A cross section of the coal pocket resembles the letter W, this form being necessary on account of the double line of boilers with an alley between them, requiring a down flow of coal by gravity at points directly over the boiler fronts. Every portion of the bottom of the bunker is such as to induce constant movement of coal in the bunker to the fire room, thus tending to prevent fires in the bunker. The crane girders in the engine room are carried directly on the side columns, which on the boiler house side are prolonged to carry the side aisle roof of the boiler house. The general design of both the building construction and the arrangement of its equipment are clearly shown in the drawing, Fig. 2, which is a cross section through the engine room, boiler house and coal pocket.

Power Station Equipment.

The unit system of design was followed in laying out the equipment of the power station, to provide for any emergencies that might call for a cutting out of a portion of the plant. The boiler plant of 32 boilers is divided into eight groups of four boilers each, four of these groups being on the first floor and four directly over them on the second floor of the boiler house. The four boilers

of each group stand opposite each other across an alley or firing space, and are separate as regards economizers, flue and stack connections, but their steam connections form them into a group for the purpose of unit subdivision; that is to say, the four boilers of the west end of the plant on the first floor, on both sides of the alley, are piped to one manifold, which is connected to a vertical header, and the four boilers directly above them on the second floor are piped in the same manner to the same header, two groups of four constituting the first unit group at the west end of the boiler room. This group is sufficient to furnish steam to the two 2500-kw. lighting units which will eventually constitute the first unit subdivision at the west end of the engine room. The second group of four boilers on the first and second floor are piped together in like manner, so that they can, as one group, supply steam to the first 5500-kw. turbo-generator. These main groups of boilers are piped together by a cross connecting header which is to be considered as an equalizer rather than as a large main into which all boilers feed.

The equipment may be divided into several distinct sections, as follows: The coal handling apparatus, the steam generating plant and boilers, with the accessory water supply system and pumps, and including furnaces, flues, economizers, stacks and ash handling plant; the turbine engines and their various auxiliaries in which the steam is used, and finally the electrical plant which converts mechanical into electrical energy and distributes it to the outgoing feeders.

Coal Handling Plant.

The power station can receive coal either by water or by rail, but was designed more particularly to deal with coal handled by water, though certain provisions were made in the design of the tower that will admit of handling coal from cars directly, should it ever be desirable. The coal pocket is located in the top of the boiler house, so that it can feed coal by gravity through spouts to the stoker hopper in front of each boiler.

The dock to which barges are brought is about 500 feet from the west front of the boiler house. A high level railway runs from the coal hoisting tower on this dock into and through the top of the boiler house over the coal pocket, at an elevation of 107 feet above the dock level. This cable railway is in the form of a loop and is operated by an endless cable. The decision to use a level coal bridge, coupled with the desire to do all the hoisting at one time, determined the height of the coal tower and called for one higher than any hitherto used for this purpose. Subsequent to this single hoisting operation the coal is passed along toward its destination in the pocket by gravity and by transportation cars along the level cable railway.

The hoisting tower has a capacity of 400 long tons of run of mine bituminous coal in five working hours and is operated by a single man. The operator's station is only a short distance above the barge being unloaded, where he can most readily direct the operations. A third hoisting engine is used for opening and closing the bucket, in addition to the two engines ordinarily used, one for hoisting and the other for trolleying it along the boom. The trolley is balanced so that it is not necessary to run the hoisting engine when trolleying, and the clearance between bucket and boom is maintained constant, while the use of counterweights on the bucket hoist eliminates the need of friction brakes, which have proved troublesome in high towers. A system of stops automatically prevents overhauling on the hoisting apparatus.

The coal is hoisted on a 2-ton Haywood clam shell bucket operated by a two-cylinder 15 x 24 inch Lidgerwood hoisting engine. The counterweighting of the bucket limits its lowering speed to 1000 feet per minute. It is suspended from a trolley carried on a rigid steel trussed boom projecting 43½ feet beyond the tower at about 163 feet above the dock. The opening and closing of the bucket is done by a "biter" engine. This is an 8 x 10 inch Lidgerwood engine, which can also be used to drive the winch head boom for warping barges along the dock. The trolley motion for running the bucket in or out along the boom is operated by a 6 x 8 inch Lidgerwood

engine. All these engines receive steam under 160 pounds pressure from the main boiler house and are located in a room in the base of the tower.

The operation is as follows: The bucket is lowered into the barge with the jaws open, digs into the coal sufficiently to inclose a full load and is closed by the "biter" engine. Then the hoisting engine starts automatically and raises the bucket about 150 feet in the air, the maximum rate of hoist being 1400 feet per minute. As the hoisting ceases the trolley motion starts automatically, running the bucket in on the boom until it is over the receiving hopper and then automatically starting the "biter" mechanism in the reverse direction and dumping the load by opening the jaws of the bucket. The return movement of the bucket is controlled by the operator. The mechanism is equipped with a full set of limiting and safety devices, as well as indicators for the guidance of the operator. The bucket can complete a round trip in 45 seconds. The machinery for hoisting and controlling the operation of the bucket was designed and built by the Robins Conveying Belt Company.

The receiving hopper is built of steel plate, and the coal passes through it by gravity to the shaking bottom, which allows small coal to pass around the crusher into the loading hopper and delivers the large coal to the crusher. The shaking grate and the crusher are both operated by a 7½ x 7 inch Westinghouse standard engine. The crusher has a capacity of 400 tons in five hours, and the coal, after passing through it, drops into the loading hoppers, which are directly above the scale platform. They are equipped with gates operated by the weigher, who loads the cable cars as they stand upon the platform. The scales have a capacity of five tons. The cable railway is capable of handling 150 tons per hour when operating 29 two-ton cars at a speed of 180 feet per minute, around a track loop approximately 2500 feet long. At present there are ten cars installed, each of about two tons capacity. The cable is driven by another 7½ x 7 inch Westinghouse engine, and is kept taut by a heavy counterweight. This engine is manually controlled, and together with the crusher engine, is in a separate little engine room on the same level and adjacent to the scales, so that the entire mechanical outfit of this part of the plant is under the control of one man. The cable railway engines can be shut down automatically if the cars are not properly released from the cable at the right point just before reaching the loading platform on the return journey, where the cable leaves the roadway to come over the winding drum. Here there is an automatic tripping device for releasing the grips so that they do not require attention when they arrive empty from the coal pocket.

The coal cars are of the side dump type. The tripping device is a heavy cam bolted to an I-beam running directly over the center of the track. The cam engages an arm that projects upward from the car, causing it to actuate the dumping mechanism of the car, thus dispensing with the necessity of any labor at the coal pocket, except the occasional relocating of the cam. The car dumps its load without letting go of the cable, proceeds around the loop and returns to the loading hopper automatically. By changing the position of the tripping cam the coal is properly distributed throughout the bin.

From the bottom of each small pocket in the coal bin a cast iron spout leads to a stoker hopper. The supply is regulated by a gate in each chute, which is operated manually by a chain from the boiler room floor. The whole plant is designed to have an ultimate capacity of 800 tons per day. It is estimated that the actual cost, including labor, supplies and fixed charges per ton of coal from the time it leaves the barge until it arrives in the bin, on the basis of 480 tons per day, is 91-3 cents per ton, which is believed to be the greatest economy yet obtained by any plant attempting to accomplish the same purpose under similar general conditions. The striking feature is the unusual height, both of the lift and of the conveying cable railway carrying coal into the pocket.

Ash Handling System.

Ashes are dumped through hoppers at the bottom of the stoker pit into small cars, so constructed that the

body is detachable from the truck. After receiving a load of ashes the car is run along a narrow gauge railway laid in the basement floor underneath the line of dumping hoppers to a turntable at the west end of the boiler house basement, directly under the end of the ash bridge. A trolley hoist is provided, which runs on an I-beam from a point over the ash pit through the bridge and over the turntable. From the trolley carriage are suspended two sheaves with forged steel hooks, which are inserted in rings at each end of the car, as it stands on the turntable in the basement. The hoist is then started, raising the car to the height of the ash bridge and stops automatically. The trolley motion then starts and the car body is carried over the ash bin, automatically dumped, reversed, returned to the inner end of the trolley hoist, and finally lowered to the turntable in the boiler room basement. The entire cycle of operations is effected by hand control with a single starting switch, the control of trolleying, dumping and lowering being entirely automatic.

The trolley is capable of hoisting 1 ton of ashes contained in a car weighing about 1500 pounds at a speed of 60 feet per minute, the speed of trolleying back and forth to the bridge being 250 feet per minute. The distance of hoisting and lowering is 70 feet each way and the horizontal distance traveled by the trolley is 100 feet in each direction. The time required for a round trip of the bucket between the power house basement and the ash bin is about $3\frac{1}{2}$ minutes. The automatic operations of the trolley are so interlocked that until one is fully completed it is impossible to start another. The bucket can be held at the top position without the use of power by a brake, which is automatically applied. While hoisting it is possible to stop and return the bucket to the starting point if desired. The trolley control is so designed that the trolley always comes to rest at the same point at each end of its travel, and lowering is impossible until the trolley is returned to its original position. Lowering is controlled by the motor and is not dependent upon gravity for speed. Independent brakes automatically hold and control the load and stop the motor. One is electric and the other mechanical, and either is capable of sustaining the full load independent of the other.

Water Supply System.

The main objects sought in the supply of water were a reliable and sufficient supply at all times and under all conditions of load; a reserve capacity in storage tanks holding sufficient water to meet emergencies; means for collecting in this storage tank the water of condensation from the turbines, so as to use it over again in the boilers; to provide for automatically supplying "make-up" water to replace the various wastes occurring in the boiler, turbine and condenser system from leakage or otherwise, and means for heating this "make-up" water enough to drive off as a vapor or to precipitate deleterious gases and solids to prevent injurious chemical action upon the valve seats, condenser tubes and other important elements in the main steam plant.

Water is taken from the mains of the Montauk Water Company, two of whose service mains are connected to an 18-inch main supplying the power house. As a reserve, a standpipe 40 feet in diameter and 80 feet high was built and connected into this 18-inch main, which under ordinary circumstances is kept full. From the 18-inch main two branches are carried into the building. Two independent cross connections between the 18-inch supply line and the city water system, one on either side of the power station, further supplement the main supply in case of accident to the pipe line. The branches are joined together inside of the building, forming a loop, which in emergency can supply the feed pumps, although under normal conditions this water is used only for "make-up" to the condensed steam returned from the surface condensers.

The condensation from the steam turbines is free from lubricating oil and can be used repeatedly without injury to the boilers. The major part of the boiler supply is, therefore, derived from the hot wells receiving the discharge from the surface condensers. For each generator unit there are two hot wells in the form of steel tanks

18 feet 4 inches by 18 feet 5 inches, and 6 feet 6 inches deep, to which the condensation is pumped. All the hot wells may be connected together. The water in these tanks is kept at a constant level by adding "make-up" water automatically through a pump governor actuated by a float valve in the tank.

The "make-up" water, if desired, may first be used for cooling purposes around the building, such as in jacketed bearings, whence it passes to the open heater. Otherwise it goes directly from the mains to the open heater, which is a cylindrical Cochrane feed water heater and purifier, made by the Harrison Safety Boiler Works. This heater is 8 feet in diameter and 15 feet long and utilizes exhaust steam from the double-acting auxiliary engines and reciprocating pumps in various parts of the building. It has sufficient capacity to heat feed water for 15,000 horse-power of boilers from 40 degrees to 205 degrees Fahrenheit.

Steam Generating Plant.

The boiler plant contains 32 Babcock & Wilcox water tube boilers set in batteries of two boilers each, eight batteries on the first floor and eight on the second floor immediately over the former. These batteries are equally distributed on each side of the boiler plant, with a firing space between about 18 feet wide. The boilers are designed for a working pressure of 200 pounds per square inch, and each has a total effective water heating surface of 5243 square feet. The general arrangement of the entire boiler plant and accessory apparatus is shown in the sectional elevation, Fig. 2. Each boiler is supplied with an internal superheater capable of superheating 200 degrees F. at 200 pounds pressure, and containing about 1116 square feet of superheating surface. The ultimate capacity of the boiler house when finally extended will be 96 boilers of the type now installed.

The boilers are fitted with Roney stokers driven in sets of eight by a $4\frac{1}{2} \times 4$ inch Westinghouse engine. An arrangement is also provided for blowing in steam above the grates to disintegrate clinkers. The contents of the ash pit are discharged down a chute terminating over the narrow gauge railway track in the basement. At the bottom of each chute is a dumping gate for loading the cars provided for the removal of the ashes.

The arrangement of flues, economizers and dampers permits the operation of the plant on the unit system, but at the same time certain features of interchangeability are incorporated, so that the flues and economizers can be interchanged and cross connected to insure the greatest capacity and highest efficiency under all conditions of operation, even though some portions of the boiler and economizer plant may be out of service. One economizer utilizes the waste heat from two batteries and boilers. Under normal conditions the gases from the four boilers discharge into their respective sections of the main flue, then pass through the economizer directly above and into the stack, being then under the control of the main damper regulator. The first and second floor dampers and the flue partition dampers are open, thus permitting inequalities of quantity and pressure to divide under the different economizers irrespective of the boilers in service. In case it is found necessary to isolate any economizer it can be done by closing its inlet and outlet dampers, and the gases can then either be by-passed directly into the stack or divided up through the other economizers. The second floor boilers can discharge into the stack through the flues and economizers and the first floor or vice versa. All the boilers can discharge through one economizer or all economizers can be cut out, and the stacks may also be cut out individually.

The boiler flues are of sheet steel and are underneath the floor on which the boilers are situated. The economizers are directly behind the boilers and over the flues. Each economizer consists of 56 sections of 10 tubes each, designed for 250 pounds pressure. The soot scrapers of the economizer tubes are driven by four small Westinghouse standard engines.

There are four stacks in the power station, of which only two are required for the operation of the present apparatus. When the station is extended the number of stacks will ultimately be six. The stacks are of open

hearth steel, entirely self supporting and are 275 feet high above the base. The inside diameter of the straight part is 17 feet 10 inches at the bottom and 16 feet at the top. The plates vary in thickness from $\frac{1}{2}$ inch at the bottom to 5-16 inch at the top.

(To be continued.)

OBITUARY.

JOHN C. KAFER.

John Christian Kafer, past president of the Engineers' Club, died at Trenton, N. J., on March 30 quite suddenly, although he had been in poor health for some time. He was born at Trenton, December 27, 1842, where his father was a partner of John G. Stevens, at one time president of the United Railroad Companies of New Jersey. The outbreak of the Civil War found Mr. Kafer in the prosecution of engineering studies and work, and in 1863 he was appointed third assistant engineer in the navy, continuing in the service until 1885. One of the principal episodes in his life was his term of service at the Naval Academy, including two tours of duty from 1868 to 1874 and from 1878 to 1882, when 11 classes of cadet engineers and cadet midshipmen received the benefit of his instruction. In 1885 Mr. Kafer declined the professorship of mechanical engineering at Cornell University, and a little later he became associated with the Morgan Iron Works of New York City, serving as vice-president, superintendent, secretary and treasurer. He then became connected with the Quintard Iron Works, and within the past month had organized the consulting firm of Kafer, Mattice & Warren. Mr. Kafer was one of the most active members of the Engineers' Club from its foundation, serving for years as vice-president and chairman of the House Committee and as president from 1901 to 1904. He also served as a member of the board of managers of the American Society of Mechanical Engineers, of which he had also been vice-president. At the time of his death he was the senior American member of the Institution of Naval Architects of Great Britain, a member of the American Society of Naval Engineers, the Society of Naval Architects and Marine Engineers, and of the Engineers', Army and Navy and Players' Clubs, New York City. Three years ago it was largely through his instrumentality that the gift of \$1,500,000 was secured from Andrew Carnegie for the United Engineering Building and the Engineers' Club, and since that time he had served as a member of the Conference Committee of 12 on the joint project, giving the work his most earnest and enthusiastic attention and serving as treasurer for the body. At the time of his death he was a member also of the board of trustees of the Engineers' Club and of its Building Committee.

GEORGE MARTIN BRILL, president of the J. G. Brill Company, Philadelphia, car builder, died from apoplexy March 31. He was born in Germany in 1846, and in 1868 with his father, J. G. Brill, formed the firm of J. G. Brill & Son, which built its first car in a shed at Thirty-first and Chestnut streets. The business steadily grew, and the Brill Company in recent years absorbed the Laclede Car Works in St. Louis and the Stephenson Car Works in Elizabeth, N. J. It also controls a plant in Cleveland, Ohio. The company employs 4,000 men and its street cars are shipped to all parts of the world.

THOMAS R. ALMOND died from pneumonia at Yonkers, N. Y., March 31, aged 61 years. He was born in England, coming to this country when a young man and locating at Fitchburg, Mass., where he was engaged as mechanical engineer for the Putnam Machine Company. He removed to Brooklyn, N. Y., about 30 years ago and built up a good business in making drill chucks for those whose work called for great precision. Later he placed a right angle drive on the market which has recently been improved and developed to large capacity. Two years ago he sold out a controlling interest in the business to C. A. Hubbell, who formed a close corporation known as the T. R. Almond Mfg. Company to continue the business at 83-85 Washington street, Brooklyn. Since then Mr. Almond had devoted all his time to experimental work.

JOHN VAUGHAN MERRICK, an engineer of national repute, died in Philadelphia March 28, aged 78 years. He was born in that city in 1828. His father, Samuel Merrick, was an eminent engineer, founder of the Franklin Institute and first president of the Pennsylvania Railroad Company. John Vaughan Merrick was graduated from the Central High School in the class of 1843 and later became a member of the firm of Merrick & Sons, builders of machinery and marine engines. He had charge of the designing of marine and other machinery for the Government during the Civil War. He became head of the firm in 1860, but in 1870 was compelled to retire on account of ill health. In 1883 he was appointed a member of the board of experts to report on the improvements of the water supply of Philadelphia. He was greatly interested in philanthropic and educational work. He had been trustee of the University of Pennsylvania since 1870, trustee of the Episcopal Academy and of the Wagner Free Institute of Science. Mr. Merrick was a member of the Union League, Philadelphia and Penn Clubs and the American Philosophical Society. He was vice-president of the American Society of Mechanical Engineers from 1883 to 1885. He is survived by two sons and two daughters.

A Large Tod Pumping Engine.

What is probably the largest municipal water works pumping engine ever constructed was recently built by the William Tod Company, Youngstown, Ohio, for Kansas City. The engine has a normal capacity of 20,000,000 gallons in 24 hours, against a domestic water pressure of 147 pounds, and for fire service will work against a water pressure of 177 pounds. The engine is of the vertical triple expansion type, the diameter of the high-pressure steam cylinder being 38 inches; intermediate cylinder, 72 inches, and low-pressure cylinder, 108 inches, and the stroke 66 inches. The pumps have three single-acting, outside packed plungers, each 32 $\frac{3}{4}$ inches diameter by 66 inches stroke. The engine occupies a floor space of about 30 x 50 feet, the total height of the machine being over 60 feet and the weight 800 tons. The engine was designed by Irving H. Reynolds, vice-president and manager of the William Tod Company.

While the engine is described as the largest municipal water works pumping engine ever built, it is more in the point of the size of the engine than in the capacity in gallons that it holds first place. There are a number of pumping engines built or under construction, ranging in capacity from 40,000,000 to 60,000,000 gallons in 24 hours, but they are all operating under much lower heads than the Kansas City machine and as a matter of fact are driven by much smaller engines. It is misleading to rate an engine on its capacity in gallons without taking into account the head pumped. For instance, the largest pumping engine in the world, as far as quantity of water pumped is concerned, has a capacity of 500,000,000 gallons in 24 hours, but requires only from 300 to 400 horse-power to operate it, as the head pumped against is only 4 feet. To do this work steam cylinders 19 x 38 inches diameter by 48 inches stroke are all that is required.

Pig Tin Imports.—United States imports of pig tin in February totaled 9,772,103 pounds, valued at \$3,270,584, or an average of 33.47 cents per pound, against 9,685,911 pounds in January, valued at \$3,208,011, or an average of 33.12 cents per pound, and 9,921,315 pounds in February, 1905, valued at \$3,068,763, or an average of 30.93 cents per pound.

At a meeting of the directors of the Tennessee Coal, Iron & Railroad Company, held March 29 at Birmingham, John A. Topping, president of the Republic Iron & Steel Company, was elected a director and made chairman of the board. After the meeting Don H. Bacon announced that he had resigned as chairman of the Board of Directors, the resignation to become effective at once, and that he had also resigned as president of the company, to become effective May 15, and that his resignation had been accepted.

Iron Ore in International Trade Relations.

The proposal before the Swedish Riksdag last year that has recently been discussed again, for an export duty on iron ore, is not so significant by reason of the immediate effect such a tax would have as because of like measures in other countries that might trail after it. It was only last year that Spain was agitating an export duty on iron ores shipped from that country to Germany, and the emphasis put in so many ways on the rapid rate of exhaustion of the world's iron ore supplies has more and more centered attention on the international aspects of the question. The more recent form of the Swedish tax proposition contemplates a duty of 1 krone (27 cents) for the first year, 1907, with an increase of 25 öre (6¼ cents) a year up to 3 kroners (81 cents). The Swedish Government has held up action on the measure in view of the pending negotiation of a commercial treaty between Germany and Sweden. In return for "favored nation" customs rates on certain Swedish products Germany asks an assurance that her importations of Swedish ores shall be exempt from any export duty for a period of years. Opinion in Sweden is strengthening against such exemption, the feeling being that if the Swedish iron industry is to be increased by means of the export duty such duty must be applied to all ore sent out of the country. The Swedish iron industry, as is well known, is based on charcoal as its fuel, and the iron exported, whether as pig iron or as refined bars, enters largely into the manufacture of high grade steel in England, Germany and the United States. To carry on charcoal iron manufacture profitably involves the use of the high grade Swedish magnetites. To use up the lower grade Swedish ores at home and export on a competitive basis the iron made from them would require lower priced mineral fuel. But Sweden has but a limited supply of coal, while in coking coal her resources are almost *nil*. If the ore, now exported were smelted at home the exportation of timber would need to be curtailed, so as to conserve the home supply of charcoal. This would mean the loss of an important factor in the present export trade and would naturally increase the price of charcoal. It is questionable if the net gain in exporting iron instead of ore would be anything like what paper computations show.

But apart from these considerations the strong sentiment in Swedish Government circles in favor of an export duty only represents the appreciation in iron ore values that has been accented sharply in the past year. No doubt the prominence given to iron ore in the effort to account legitimately for the capitalization of the United States Steel Corporation and the wide publicity given to the further acquisitions of ore by the corporation in the five years of its existence have done much to create a world wide concern about ore supplies. The past year has exceeded all others in the literature it has produced on the world's iron ore deposits and the prospect of their exhaustion. The British Government had its foreign representatives report last year what the available iron ore supplies were in their respective countries, and later the report of the Swedish Geological Survey, in response to a resolution of the Swedish Parliament asking for information as to the known iron deposits in Sweden and other countries, has been generally commented upon. The United States, as these investigations have emphasized, is the one prominent iron producing country whose production of iron ore is practically the same as its consumption. Great Britain imports heavily and Germany and France depend in part on outside sources, while

Spain and Sweden are conspicuous as countries producing several times more ore than they consume.

It is inevitable, with the sharp international rivalry in trade growing sharper every year, that the countries best endowed with iron ores will make those dependent upon them pay a price in harmony with the enhancing value of such deposits. Whether there be an export tax or whether exemption from such tax be bartered for a return concession in trade the ores of iron will cut a larger figure in international trade than has been thought of heretofore. In this connection it would seem that iron ore as a factor in the trade relations of the United States and Canada has not been considered in the light of all its possibilities. With the failure of Canada thus far to bring to light any such native resources in iron ore as her ambitions in steel production demand for their realization a situation can readily be conceived of in which an export tax on Lake Superior ores from the United States would be exceedingly inconvenient to our neighbors on the north. Newfoundland, too, may find in her iron deposits an important key to future relations with the Dominion Government.

The British Trades Dispute Bill.

The wholly unexpected surrender of the Government party in the House of Commons to the Labor party in the matter of the Trades Dispute bill promises to become a momentous event in British industrial history. The bill, which passed the House by an overwhelming majority, was considered in some detail in last week's issue of *The Iron Age*. It is so ultra-radical, really overwhelmingly so, that no one considered it had a chance of winning. Yet it promises to become a law unless the House of Lords intervenes, which students of recent parliamentary history believe to be doubtful. Labor unions are made exempt from all financial liability resulting from trades disputes, providing they do not transgress the criminal statutes. Briefly stated, the bill provides that no person is liable because he has done an action in furtherance or contemplation of a trade dispute which interferes with another person's business; the action of any combination of persons which would not be illegal if done by one person is legalized; no action can be brought against a trade union or against any person or persons representing the members of a trade union in his or their representative capacity; and it shall be lawful for members of a union "to attend at a man's house to persuade him not to work," which last provision, coupled with the previous provisions, legalizes picketing to an unprecedented extent.

Such a law would be a grave matter. The whole thing is so revolutionary in its bearing upon the relations of employer and employee as almost to constitute a threat to the welfare of British industry. If such a bill had been introduced in the American Congress, or in the legislature of one of the States, it would have been scouted as a freak measure. The criminal laws are not involved, but the union leader who would seek or permit the violation of a criminal statute to further the purpose of a strike, when he is given such latitude as this law would give, would be wanting in simple common sense. In this country the action of the British Parliament is a menace only as a precedent, as a sign of the times in Great Britain. But even in this somewhat remote sense there is food for serious thought. It is a suggestion to employers to be alert and watchful of all legislation which would take from a labor union or its members the financial responsibility which is as fair to the employee as the employer's responsibility is to him.

The Future Development of Machine Tools.

The remark is occasionally heard that machine tools are likely hereafter to be improved much more slowly than in the past, especially in the recent past. Doubtless this opinion is based upon the extraordinarily rapid evolution of this class of machinery made necessary by the adoption of the high speed steels, coupled with the equally wonderful development of machine tools for precise work, as demanded by modern manufacturing methods. Probably bearing on this view of the future is the lull in the bringing out of new machines resulting from the concentration of the energies of machine tool builders in procuring the maximum rate of production in their own works and in otherwise looking after a demand which has latterly been far greater than the supply.

As a matter of fact, however, the evolution of the machine tool will surely progress as rapidly as it ever has as soon as builders have the time to devote to the development of their product. Probably there is not a machine tool builder in the country who has not some improvement held in reserve for the time when business shall slacken. One occasionally hears of this or that new tool which is being kept out of the market for the time being. An important builder of heavy grinding machinery remarked recently that he had a materially improved machine in his mind ready to develop and manufacture as soon as competition shall demand it. A lathe builder made a similar statement, outlining a machine which contains radically new features. These are typical instances, and in very many more cases complete silence surrounds the possession of undeveloped business plans of the sort.

Competition will always compel improvements, and the lack of it will cause a temporary let-up in their announcement. In the new machines the effort will be either to procure more rapid production or greater accuracy or greater facility of operation, or all of these improvements combined. This is true of standard tools as well as of machines for special purposes, for which the demand must always increase, permitting of an almost endless opportunity for improved methods of manufacture. Hundreds of expert machine tool designers are at work to-day on new ideas which will eventually be felt in the market. Past development has been exceedingly rapid, but the fact is rather a proof of equally important progress for the future rather than an indication that all of the great principles of machine design have been mastered in all their details.

A proposition to substitute producer gas plants for the steam plants now operating the jute mills of Dundee, Scotland, is under discussion. In view of certain proposed large developments in connection with the corporation electric station and service the probability is strong that one or more of the mills will use electric power furnished from this station. A suggestion has been made which ought to bear good fruit if properly carried into effect, which is that several of the manufacturers should combine in the erection and maintenance of a Mond producer gas plant of sufficient size to operate all of their plants with margin for expansion, each mill having its own engines, supplied from the one producer. A recovery plant for the recovery of the ammonium sulphate is a feature of this scheme.

For handling large concrete blocks used in building a sea wall an immense crane has been erected at Durban, Natal, with a capacity of 20 tons at a rate of hoist of 10 feet per minute. The run is 1435 feet and width of span 135 feet. The traveler on top of the gantry weighs over 90 tons, and is equipped with four motors operating at

500 volts. The hoisting motor is rated at 20 horse-power, the cross traverse motor at 12 horse-power, while the two motors used for longitudinal motion are 24 horse-power each. Six speeds of travel are obtainable, from 100 to 300 feet per minute. All the motors have gravity brakes connected in series with their fields. The crane itself weighs about 95 tons, and the height from the ground to the rails is 22 feet.

Commercially Pure Magnetite.

It is of more than passing interest to record the fact that Witherbee, Sherman & Co., Inc., operating the well-known magnetite iron ore mines at Mineville, N. Y., have recently shipped in carload lots concentrated iron ore of over 71 per cent. purity. It should be borne in mind that pure magnetite contains 72.41 per cent. iron, and that, therefore, the results as disclosed in the accompanying tables show the degree of perfection obtained.

Without a doubt these shipments, which went forward to the General Electric Company, Schenectady, N. Y., and to the Monsanto Chemical Works, St. Louis, Mo., are the purest iron ores ever shipped in quantity. Only once have these figures been surpassed when a carload analyzing 71.85 per cent. iron was shipped by the same company to the General Electric Company.

This material was turned out by the magnetic concentrating plants at Mineville to meet a special demand. The average iron in the daily output is from 66 to 67 per cent. for the purest grade of concentrated ore, none falling below 60 to 61 per cent. for the lowest grade, with the output of the mines approaching the 900,000 ton per year mark.

With reference to the special ore, the run-of-mine was first crushed and then cobbled by a magnetic separator to eliminate the bulk of the lean ore and such rock as might be in the ore. This cobbled product was further crushed in rolls to pass a 16-mesh slotted screen plate, after which preparation it was passed twice over magnetic separators to give the final product.

The analyses from the sample quartered from concentrates gathered in quantity throughout the whole time of loading are below:

	Enrique Touceda, Albany, N. Y.	Northern Iron Company, Port Henry, N. Y.	Witherbee, Sherman & Co., Mineville, N. Y.
Iron	71.02	71.57	71.20
Silica	0.89	0.814	1.02
Phosphorus	0.006	....	....

A portion of the sample furnished the Northern Iron Company for checking was washed to remove the fine dust clinging to the particles of ore, with the following results:

Iron	71.75
Silica	0.688

A hand screening test was made of the material to show the relative coarseness, and the result was as follows:

	Screen sizes.	Percentages.
On.....	8 mesh.	00
On.....	16 mesh.	3.71
On.....	20 mesh.	10.64
On.....	40 mesh.	44.23
On.....	60 mesh.	13.08
On.....	80 mesh.	8.91
On.....	100 mesh.	7.69
Through.....	100 mesh.	11.74
Total.....		100.00

From the iron master's viewpoint these sizes are not objectionable for furnace mixtures, particularly in consideration of the especially low percentage of phosphorus, 0.006 per cent. This grade of ore possibly opens up an important commercial field for a low phosphorus ore.

The Department of Docks and Ferries, New York, will receive bids at Pier A, foot of Battery place, North River, at 2 o'clock on April 6, for furnishing materials for building three new ferry bridges and pontoons, including parts of hoisting and mooring machinery and like equipment. The security required is \$7500 and it is probable that work will be given out in bulk, and if this is so the contractor who is awarded the job will probably require considerable machinery equipment.

Electric Motors for Roll Trains.

In a paper on "Electric Motors and Their Applications," read before the Engineers' Society of Western Pennsylvania, W. Edgar Reed refers to the progress made in the introduction of electric drives in rolling mills. From this portion of the paper we make the following extracts:

Electric motors of both the alternating and continuous current types have been used for operating nearly all the auxiliary apparatus in iron and steel mills, including cranes, hoisting, hauling, transfer tables, shears, punches, saws, cross rolls, straightening rolls, screwing down rolls, roller beds for slabs, ingots and blooms, pouring steel, horizontal charging machines for open hearth furnaces, &c. The variable speed motor is used universally for cranes and hauling and generally for screwing down rolls, for charging machines, small reversible roller beds, and for pouring steel. The compound type of motor is used for large roller beds and those which are not frequently reversed, for saws, cross and straightening rolls, punches and shears and transfer tables. The motors used for roller beds are generally mounted in pits and covered so as to keep out the dust and dirt.

Aside from the auxiliary apparatus, motors are now also being used to drive some of the rolls of steel and iron mills. Eight and a quarter inch rolls at the Remschied Works are driven by 100 horse-power 225 to 350 revolutions per minute motors for rolling tool steel from 1½-inch section bars. Compound motors of 1200 horse-power are now being installed at the Phoenix Mills, also in Germany, for reversing rolls. A 1500 horse-power motor has been in use at the Pittsburgh Reduction Company's works for several months for driving rolls. Two 1500 horse-power compound wound 100 revolutions per minute motors, suitable for 25 per cent. increase in speed, are now being installed at the Edgar Thomson Works of the Carnegie Steel Company for rolling mills.

Larger Use of Motors in Mills.

Although motors are now used in a few mills for driving the smaller rolls, it is believed by most mill and electrical engineers that they will eventually be used for driving the entire mills. Mill motors in general must stand intermittent excessive loads, and the flexible connection which electric motors furnish between the prime mover and the load will surely prove a great saving in repairs over the steam driven rolls. When the mills have their own generating plant certain variations in line voltage are generally permissible. When large motors are used for blooming mills or similar service it is of great importance, however, to flatten out the current peaks which will develop at overloads, such as those produced when bars enter the rolls. A system which will greatly assist in reducing these peaks, and is especially applicable for infrequent starting and reversals, consists in mounting a heavy fly wheel on the shaft of a compound type motor, the motor being so designed that its speed will drop enough at a predetermined overload to allow the inertia of the fly wheel to automatically take the overload. By properly designing the motor and fly wheel the overload at the motor and power house can be kept within reasonable limits so that no disturbing effect will be felt by other motors on the circuit. In order to get the best efficiency under normal loads when a wound rotor induction motor is used with this system a resistance is automatically thrown in the rotor circuit at a predetermined overload, thus lowering the speed and allowing the fly wheel to take the overload.

The Ilgner System in Germany.

In cases where the voltage regulation must be fairly good a system similar to the Ilgner system, which has been used in Germany, can be applied. This is also applicable to hoisting and similar work. The Ilgner system is somewhat similar to the Ward-Leonard system, with the addition of a fly wheel, and consists of a motor generator set, with a heavy fly wheel mounted on their common shaft. The motor can be either alternating or continuous current, having the compound characteristics so that the fly wheel will take the overload. The motor is connected

directly to the supply circuit. The generator is a compound wound continuous current machine, the shunt field being separately excited from a machine mounted on the motor generator shaft. The generator current is used for operating a continuous current motor which is connected to the rolls and is excited from the generator exciter. The speed of the motor can be changed by varying the exciting current of the generator. The efficiency of this system even at low speeds is very good. It can be applied when it is necessary to reverse the rolls, as it is only necessary to reverse the generator field to reverse the direction of the roll driving motor. The above system is now used for operating 18-inch rolls at the blooming mill of the Bethlen-Falva Iron Works (Germany). The motor has a capacity of 600 horse-power at 5800 volts, 50 cycles, 16 poles. The generator (good for 100 per cent. overload) has a capacity of 500 kilowatts at 510 volts, 300 to 365 revolutions per minute. The fly wheel weighs 20 tons and it absorbs 16,000 horse-power seconds when the speed changes from 300 to 365 revolutions. The roll driving compound motor has 200 horse-power normal and 600 horse-power overload capacity and runs at 60 to 110 revolutions. A 12-ton fly wheel is mounted on this motor shaft. The roughing mill has 14-inch rolls and is driven by a motor having the same capacity as the blooming mill motor, but runs at 150 to 230 revolutions per minute approximately, and has an 8-ton fly wheel. It is stated that the load fluctuations at this plant are very small, and constant power is taken from the supply mains.

Pacific Coast Notes.

SAN FRANCISCO, CAL., March 28, 1906.—The project of having a steel plant somewhere in the neighborhood of San Francisco Bay is again revived. The statement comes through L. Michaels, president of the San Francisco Coke & Gas Company, that a New York capitalist and stockholder in the Standard Oil Company and in the Harriman lines of railroad was out here not long since on a trip having for one of its objects the examination of the facilities afforded by San Francisco and its vicinity for the establishment of such a plant. This follows on the statement made last year by the same gentleman, the purport of which was that the \$5,000,000 to be invested by New York capitalists in the establishment of the opposition gas company was but the beginning of investments of New York capitalists in the industries in San Francisco and its neighborhood, and that they were prepared when the time came to embark in the building up of great enterprises, particularly with a view of supplying the trade of the Orient.

One of the oldest industrial establishments in this State has been known as the Selby Smelting & Lead Works. This was founded by the late Thomas H. Selby, an extensive iron and hardware merchant, and has always been most successful. The American Smelting & Refining Company has long had its eye on this great establishment, which did business from the Arctic Ocean to the Isthmus of Panama, and it has at last been captured. The company will build a smelter closer to San Francisco than is the present one, and it is said that a large tract of land has been purchased for that purpose on the ocean shore near San Bruno. The Guggenheims have invested \$3,500,000 in the new smelter near Port Costa, so that this city will be well supplied with plants for the reduction of the lead and copper ores of the coast.

The rains have delayed somewhat the opening of the spring trade, or rather that part of the trade that is left to this season, and matters consequently have been somewhat dull. However, it is expected that April will witness the opening up of a big business. J. O'L.

The Buffalo Crucible Casting Company has located its plant at the foot of Washington street, Buffalo, N. Y., in the premises formerly occupied by the Tiff Foundry Company, having had the buildings fitted up for the crucible casting business. The company will start its first new furnace Monday next.

Customs Matters.

Gun Ribs for Shotguns.

It has been determined by the Board of United States General Appraisers that gun ribs are dutiable at the rate of 50 per cent. under the provision for "parts of guns." Gun ribs are the pieces of metal put between the barrels of a double barreled gun, joining them together. William Read & Sons objected to the action of the collector of customs at Boston in returning the articles for duty. The matter came before the board, where the importers insisted that the ribs should be admitted free under paragraph 658, relating to "shotgun barrels in single tubes, forged, rough bored." In an instructive opinion written for the board, General Appraiser Fischer overrules the contention of the importers. According to Mr. Fischer the claim of the importers is without merit because a provision for the free entry of gun barrels in single tubes cannot reasonably be stretched so as to cover articles that are used only on double barreled guns, especially a provision so restrictively worded as the one in question.

Gas Cylinders.

Final briefs have been filed with the Board of United States General Appraisers in the controversy between the Government and importers regarding the customs classification of long steel cylinders for holding gas under pressure, and the matter is now before the tribunal for decision. The indications are that the board will render a decision during this month. The test case stands in the name of the Liquid Carbonic Company, New York, and on account of the importance of the issue the litigation will probably eventually reach the Circuit Court of Appeals, and possibly the Supreme Court. The question for the Board of Appraisers to determine is whether the articles are "tubes" dutiable at 35 per cent., as contended by the importers, or whether they are "manufactures of metal" and therefore dutiable at 45 per cent.

Open Hearings in Customs Cases.

Since the issuance of the order by the Secretary of the Treasury granting so-called open hearings in reappraisal cases at the discretion of the Board of United States General Appraisers there has been much speculation among importers concerning the practical working of the order. Many persons have been under the impression that because the board is authorized in its judgment to permit an importer, whose invoice values are in dispute, to be present with counsel to examine Government witnesses, no evidence other than that adduced at the open trial will be received by the general appraisers. There is excellent authority, however, for the statement that the board will not require witnesses to appear before it in reappraisal proceedings and be examined openly by the importer and his counsel, unless such witnesses signify in advance their willingness to submit to the examination.

It is understood that the board will receive any or all evidence deemed competent, whether it is submitted in the presence of the litigant or not, many of the general appraisers being convinced that few merchants will give the Treasury Department the benefit of such information as they may possess if they are to be subjected to rigid cross examination at the hands of lawyers. Many prominent importing firms are already complaining that open hearings in the slightest degree would permit unscrupulous importers to make small test entries with a view to having the large merchants summoned before the board, where they would be obliged to divulge trade secrets for the benefit of competitors, or those desiring to be so.

Customs Practice in Appraisal.

An important decision affecting the customs practice in appraisal and reappraisal proceedings was announced by the United States Circuit Court of Appeals at New York, March 24. The points before the appellate tribunal for decision were whether a reappraisal of merchandise by a United States general appraiser, or a board of three general appraisers, is invalid when all of the merchandise or samples of every variety under reappraisal are not present before the officers, and sec-

ond, if such a reappraisal is invalid, should duty be collected on the value entered in the invoice or on the value fixed by the local appraiser? In other words, should the duty be collected upon the value fixed by the last valid appraisal or upon the value fixed by the importer in his entry? Judge Lacombe, in his decision for the Appellate Court, reverses the Circuit Court, and holds that reappraisals are valid if the provisions of section 2901 of the Revised Statutes have been complied with. This section specifies that one package of every invoice, and at least one package of every ten packages of merchandise covered by an invoice, shall be examined by the appraising officials.

Judge Lacombe also holds that duty should be collected upon the value fixed by the last valid appraisal, rather than upon the value fixed by the importer. The decision is a victory for the Government, and also probably has the effect of saving importers in general a great deal of annoyance.

The Currier Trademark Bill.

WASHINGTON, D. C., April 3, 1906.—The new Currier trademark bill was reported to the House on the 27th ult. by the Committee on Patents with a strong recommendation for its immediate passage. It is designed to remedy defects that have developed in the practical operation of the Bonyngue trademark act, which went into force April 1, 1905. As reported by the committee it provides as follows:

Text of Bill.

That section 1 of the act entitled "An act to authorize the registration of trademarks used in commerce with foreign nations or among the several States or with Indian tribes, and to protect the same," approved February 20, 1905, be and is hereby amended by inserting after the words, "description of the trademark itself," the words, "only when needed to express colors not shown in the drawing," so that the section as amended shall read as follows:

"That the owner of a trademark used in commerce with foreign nations, or among the several States, or with Indian tribes, provided such owner shall be domiciled within the territory of the United States or resides in or is located in any foreign country which by treaty, convention or law affords similar privileges to the citizens of the United States, may obtain registration for such trademark by complying with the following requirements: First, by filing in the Patent Office an application therefor, in writing, addressed to the Commissioner of Patents, signed by the applicant, specifying his name, domicile, location and citizenship; the class of merchandise and the particular description of goods comprised in such class to which the trademark is appropriated; a description of the trademark itself only when needed to express colors not shown in the drawing, and a statement of the mode in which the same is applied and affixed to goods, and the length of time during which the trademark has been used. With this statement shall be filed a drawing of the trademark signed by the applicant or his attorney and such number of specimens of the trademark as actually used as may be required by the Commissioner of Patents. Second, by paying into the Treasury of the United States the sum of \$10, and otherwise complying with the requirements of this act and such regulations as may be prescribed by the Commissioner of Patents."

Sec. 2. That the Commissioner of Patents shall establish classes of merchandise for the purpose of trademark registration, and shall determine the particular description of goods comprised in each class. On a single application for registration of a trademark the trademark may be registered at the option of the applicant for any or all goods upon which the mark has actually been used comprised in a single class of merchandise, provided the particular descriptions of goods be stated.

Sec. 3. That any owner of a trademark who shall have a manufacturing establishment within the territory of the United States shall be accorded, so far as the registration and protection of trademarks used on the products of such establishment are concerned, the same rights and privileges that are accorded to owners of trademarks domiciled within the territory of the United States by the act entitled "An act to authorize the registration of trademarks used in commerce with foreign nations or among the several States or with Indian tribes, and to protect the same," approved February 20, 1905.

Sec. 4. That this act shall take effect upon its passage.

New Fees Required for Rejected Applications.

The committee has abandoned the original second sectional bill, which permitted applications filed and rejected under the law in force prior to April 1 last to be revived by an amendment without the payment of an additional fee. The committee has reached the conclusion that marks rejected under the old law should not be reconsidered by the Patent Office except on the basis of an entirely new application.

It will be noted that the committee has made no provision for the adherence of the United States to the Madrid agreement, under the terms of which trademark owners in the United States would be able to secure protection in certain countries at greatly reduced expense. This was provided for in the original Currier bill, but after a careful investigation the committee is satisfied that operations under the agreement are still in an experimental stage, and that the adherence of the United States would be of far greater advantage to foreign trademark owners than citizens of this country, and incidentally would result in a heavy loss to the revenues of the Patent Office.

W. L. C.

The Output of Coal from the Pittsburgh Vein.

In a recent issue of the *Pittsburgh Post* appeared an article regarding the production of coal from what is known as the Pittsburgh vein and within the Pittsburgh district, covering the years of 1903, 1904 and 1905. A record has been made of production of coal from this vein, arranged in tabulated form, so that the output of every working mine in the Pittsburgh district is given. The shifting of tonnage in the three years strongly indicates the depressed and active business conditions, and in addition it shows the enormous drain upon the Pittsburgh vein.

The record gathers first the reports of the various mines under the control of the Pittsburgh Coal Company and its subsidiaries, and the total of these for 1903 amounted to 21,708,764 tons. In 1904 the total for the same company was only 18,423,747 tons and in 1905 it changed to a slightly lower figure and amounted to 18,391,795 tons. This report shows that the Pittsburgh Coal Company in 1904 produced 3,285,000 tons less than in 1903, and in 1905 it continued to drop, but only 31,952 tons under 1904. The production given under the Pittsburgh Coal Company includes that of the Monongahela River Consolidated Coal & Coke Company.

In contrast with this the record of independent companies in the same district and operating in the same vein is given, showing that these independents have been making steady progress in their competition with the big company. In 1903 the independent mines produced 16,202,536 tons, or 5,000,000 tons less than the Pittsburgh Coal Company. The following year the same interests produced 18,014,113 tons, or only 409,000 tons less than the big company, this being the year in which it lost heavily in production with business depressed seriously. In 1905 the relations of the Pittsburgh Coal Company to the independents, compared with 1903, were reversed, as the independents proved the greater producers, having a total of 23,456,835 tons, or over 5,000,000 tons greater than the big company.

When the increase in competition in the Pittsburgh vein is so marked the idea is better gained as to the general increase in competition against the big company throughout the States in which it operates. It has been this marked increase in tonnage of independents which has caused the statements of overproduction to be issued from time to time as the cause for the depression in prices and actual tonnage. It is a fact, however, that independent operations have gone right on increasing from year to year and have been gradually supplanting the big competitor by keen competition.

The Pittsburgh vein is now about all held by coal companies in active operation, and there is practically none for sale, unmined. In the Freeport vein, however, much coal land is being gathered up, and a significant report is that the M. A. Hanna interests of Cleveland, and which have been working hard to secure a stronger hold on the Pittsburgh vein, have at last gone into the Freeport vein and have been quietly gathering up large blocks of that coal up the Allegheny Valley, and as soon as the Allegheny River is available for navigation unusual activity in that district will be noted. In the meantime the same interests are preparing to operate by rail from some of the new properties secured in that field.

Specifications for Rails and Structural Steel.

Among other committees reporting to the annual meeting of the American Railway Engineering and Maintenance of Way Association at Chicago, March 20 to 22, were those on Rails and Iron and Steel Structures. Some revision of the specifications of last year for iron and steel structures were reported, those of special interest to the steel trade relating to the phosphorus limit and to the ultimate strength of structural steel. It was then decided by the committee to reduce the phosphorus content for acid steel from 0.08 per cent. to 0.06 per cent., and elongation as originally reported was changed from 18 per cent. to 15 per cent. A motion to increase the mean ultimate tensile strength of structural steel from 60,000 pounds to 62,000 pounds was discussed at length and the matter was referred back to the committee for recommendation at the next annual meeting. The committee was also requested to conduct a thorough series of experiments on the subject of impact and report at the next meeting.

The discussion on steel rail specifications was largely tentative, since the proposed specifications of the American Society of Civil Engineers will be taken up at the annual meeting of that society in June. The following paragraph was adopted:

There shall be sheared from the end of the blooms formed from the top of the ingots not less than 25 per cent., and if, from any cause, the steel does not then appear to be solid, the shearing shall continue until it does. If, by the use of any improvements in the process of making ingots, the defect known as piping shall be prevented, the above shearing requirements may be modified.

F. E. Abbott of the Lackawanna Steel Company and a member of the committee, was not in favor of the adoption of the paragraph, on the ground that manufacturers would oppose it. The object is to get rid of the piping, and if it can be removed by shearing 15 per cent., manufacturers will not agree to shear 25 per cent. Mr. Webster, chairman, said that this would simply be going back to the old requirement, which is known not to accomplish the object.

The committee asked for information during the year on the cause and nature of failures in 70, 75, 80, 85, 90 and 100 pound rails. In explaining the kind of information wanted, Mr. Trimble, of the Pennsylvania lines, and a member of the committee, said:

"The 85-pound rail is by some people called a shallow-head rail; other people have a rail which has a deeper head, and the statement has been made that the American Society's rail is defective in having a shallow head. It has been stated that the head is so shallow that it fails by shearing in the track. We use the 85-pound, the American Society section, and I haven't seen any cases of that kind, although it has been reported to me that there have been such cases on our road. I have been told that other 85-pound rails with a deeper head, have been better wearing and stronger than the American Society section rail. If you will look at the 100-pound rail of the American Society and compare it with the other 100-pound rails, you will see there is very little difference in the depth of the head. The difference is so small I do not think you could tell it by observation in the track, either from the effect of the loads that pass over it or in any other way. In the 85-pound rail the variation in the depth of the head is very marked, and we have the statement of the manufacturers that the 85-pound American Society rail is a defective one. I am not sure about the other weights, but I assume that the same difference applies to the 80-pound and the 90-pound rails. We are asking now for definite information to compare the American Society section with other sections which have a deeper head, to find out whether we should have a deeper head or not."

A motion to adopt the A. S. C. E. specifications relating to drop tests was carried; also a motion to adopt the committee's recommendations for shrinkage clause. A motion to adopt the A. S. C. E. specification for chemical composition, including a footnote recommended by the committee, reading, "Carbon may be reduced to suit local conditions," was finally carried.

The committee's recommendation concerning straightening rails provided that there should not be a greater variation throughout their entire length than 3 inches from a straight line when delivered to the cold straightening presses. Mr. Abbott opposed the clause. He said the mill would ordinarily try to keep down to 1 inch, and make them perfectly straight, if possible; but if by mishap rails should come down that had a camber of $3\frac{1}{4}$ inches, the mill would expect to straighten those rails and make them first quality rails, and they would object to a clause in the specifications which would require them to make such rails second class. The specification was adopted as recommended.

Free Alcohol Bill Reported.

WASHINGTON, D. C., March 30, 1906.—At a meeting of the House Ways and Means Committee this morning it was decided by a vote of 16 to 2 to report the free alcohol bill to the House without amendment. Chairman Payne was instructed to write the report to accompany the bill. The minority report will be prepared by Mr. Dalzell. This conclusion was arrived at after a lengthy meeting involving considerable discussion.

Outline of Bill.

The bill as presented will permit the use of methylated alcohol free of tax and without any governmental supervision whatever after leaving the methylating warehouse. Thus consumers of alcohol for heat, light and power purposes will be able to buy in open market any quantity of methylated spirits that may be desired and use it as freely as they could employ kerosene, both the committee and the Commissioner of Internal Revenue being convinced that pure spirits cannot be recovered from a methylated mixture at less cost than pure grain spirits can be distilled from proper raw materials. The bill will also clothe the Commissioner of Internal Revenue with authority to permit the use of special denaturants, to be employed in rendering nonpotable alcohol used in industries where methylated spirits would not be available. This provision is based upon the laws of Germany, France and Great Britain, under which the excise authorities are permitted to substitute denaturants especially adapted to the industry in question in place of the standard methylating agent, which consists of about 5 per cent. of methyl alcohol with an admixture of pyridin base.

A third provision of the bill embodies the so-called Lovering measure, under which manufacturers may withdraw pure domestic alcohol from bonded distillery warehouse for the manufacture of goods for export with benefit of the internal revenue tax under the same conditions that now govern the allowance of drawback of duty paid on imported alcohol employed for the same purpose. This comprehensive program will render free alcohol available for many industries in which methylated spirits could not be used.

The hearings on the free alcohol measures before the Ways and Means Committee have stimulated great interest in the subject in both houses, and several members of the House have taken advantage of the latitude allowed in general debate to deliver speeches on the proposed enactment, pointing out the benefits that would be derived from the adoption by the Government of an up to date policy for the treatment of industrial alcohol. Representative Marshall, of North Dakota, has made an exhaustive study of the question with reference to the use of methylated spirits for the production of heat, light and power on the farm. He has inspected the works of several manufacturers of gas engines and has gathered considerable data from which he predicts an enormous consumption of denaturalized alcohol. After a presentation of interesting facts on this phase of the question he quoted the following extract from a recent report by U. S. Minister Squiers at Havana, Cuba:

Mantanzas, a city of about 40,000 inhabitants, has water connection in 1700 out of 4000 houses, which use about 100,000 gallons a day. The water works, operated by an American company, are located a few miles distant from the city, where there are springs giving excellent water in sufficient quantities to supply a city of 100,000 people. The alcohol motor pump, used on Sunday last for the first time, is of German manufac-

ture and cost, complete with installation, \$6000. This motor pump is a 45 horse-power machine and is operated at a fuel cost of about 40 cents an hour, or \$4 a day of ten hours, pumping 1,000,000 gallons of water. As alcohol here is very cheap (10 cents a gallon) the running expenses of these motors are at the minimum. The Germans are selling in Cuba many such motors for electric lighting and water plants at very low prices. One firm has a contract to put in an alcohol motor pump at Vento, for use in connection with the Havana water supply, which is expected to develop 180 horse-power, to cost, with installation, about \$25,000, and to pump 1,000,000 gallons an hour at a fuel cost of \$1.60. The same firm has installed an electric plant alcohol motor of 45 horse-power, which supplies 138 lights (Hersch lamps) at a fuel cost of 5 cents an hour.

In conclusion Mr. Marshall said:

For over 40 years we have stood in a false attitude toward certain of our home industries, fostering tenderly the producers of wood alcohol, illuminating and fuel oils and gasoline by maintaining a prohibitive revenue tax against alcohol, the only material that could successfully compete with them. Furthermore, by means of this same tax we have throttled the producers of our chemicals and chemical products and have sat idly by amidst a veritable revolution in the chemical world, permitting Germany to grow to the first rank in the manufactures allied with chemistry, while our similar industries in the meantime have stood palsied and shackled. The proposition is, then, so far as these industries are concerned, to go back over 40 years and begin where we left off and regain as best we may the lost ground.

Programme of Opponents.

It is the hope of the wood alcohol interests, which are now opposing the projected legislation, to defeat it in the Senate, and for that purpose they have several agents on the ground here who are devoting their special attention to the members of the Senate Finance Committee. Appreciating the overshadowing importance of that phase of the free alcohol question which relates to the value of methylated spirits as fuel for internal combustion engines, these agents are circulating a paper filed with the Ways and Means Committee by the wood alcohol refiners, in which is embodied a statement by Andre Massenet, general manager of the American Panhard & Levassor Company, manufacturer of automobiles, in which a series of tests of alcohol and gasoline is described and the conclusion is reached that gasoline is a superior fuel for this purpose.

Outlook for Passage.

Arrangements are being made to call the bill up in the House at an early date. A preliminary canvass shows so large a majority in favor of the bill that it probably will be taken up under the parliamentary order known as "suspension of the rules," which requires a two-thirds vote for passage. The House leaders, however do not care to send the bill to the Senate until a date has been fixed for a vote upon the freight rate bill now pending in that body. It is altogether likely that the measure will be passed by the House within the next fortnight.

The situation in the Senate with respect to the alcohol bill is very satisfactory. It is understood that Senator Allison of Iowa, the ranking member of the Finance Committee, has become a strong advocate of the bill, and it is known to be favored by considerably more than a majority of the Senators on both sides of the chamber. There seems good reason to believe the bill will pass both houses during the present month, in which event it would go into force about August 1.

W. L. C.

The Sharon Steel Hoop Company, Sharon, Pa., has under construction an extension to the open hearth building, but has no intention of adding more furnaces, the building being enlarged for the purpose of giving more room for the handling of steel. The company will soon place the contract for a steel building to cover its 22-inch and 12-inch mills. The building over these mills at the present time is frame. Other improvements are planned which will lessen the cost of making steel, but will not increase its capacity.

The Milwaukee Coke & Gas Company, Milwaukee, Wis., charged a new battery of 40 coke ovens March 28 and will within a few weeks have another battery of 40 ovens ready for service, thus doubling the number with which the company started business two years ago and giving it a capacity of 1000 tons of coke a day.

Mexican Railroad and Business Notes.

The Monterey Steel Works.

DURANGO, March 28, 1906.—The active buying of shares in the Monterey Iron & Steel Company, to which reference was made in a recent article, has continued, until the price has reached a figure almost double that at which they could be purchased a few weeks ago. The movement commenced about the time of the publication in *The Iron Age* of Secretary Limantour's denial of the rumor that the Government intended to reduce greatly the existing tariff duties on iron and steel manufactured products. Whether this was a mere coincidence, or whether the statement of Señor Limantour encouraged certain foreign capitalists to seek these investments in the belief that a settled policy of the Government in relation to the domestic industry of iron and steel making might be regarded as a guarantee of future prosperity and profits is an open question. At any rate the rapid advance in the value of the shares and the evident desire of a group of individuals to obtain possession of all that can be had have given rise to a number of rumors, more or less sensational. It has been said in Monterey that an important United States corporation is seeking to get control of the works, but the assertion is denied by members of the Board of Directors. The view taken by the local press is reflected in the following excerpt:

What is taking place is that a few wealthy American capitalists are in the Mexican share market buying up all of the company's stock which they can get. It appears to be the intention of the purchasers to obtain control of the plant by buying a majority of shares, and when they shall have succeeded in this they will begin to execute their plans in regard to the operation of the plant.

Aside from this feature, however, the plant is entering upon its most prosperous era. Many things in regard to this year's developments have transpired which show that it will shortly be enlarged into a gigantic industry. The work has been begun of erecting new steel furnaces, with which the plant will turn out 500 tons of steel per day and be able to furnish Mexico with all the rails and other material which will be needed in railroad construction for years to come, in addition to meeting the ever growing demand for structural steel.

A special meeting of the shareholders has been called for March 31.

Railroad Construction.

According to statistics given out by the Department of Communications, the total length of railroads in the republic at the close of the year 1905 was 16,933 km. 831 meters, of which 411 km. were constructed in that year.

In addition to the extensions on which construction work is now proceeding, the Mexican Central Railway Company is about to start work on a new line in the State of Jalisco. This is a branch road from Ocotlan to Atonilco, which is ultimately to be extended to Arandas. The contract for the work has been let.

The Pan-American Railway Company has awarded the contract for the construction of some 240 km. of its track remaining uncompleted to the Guatemala border. Eighteen months is the time limit for the construction.

A railroad 75 km. in length will be constructed by the Continental Copper Mining Company, which owns and operates mines at Panuco, in the State of Coahuila. The line will connect either with the National or the International road, as may be decided upon after bids and estimates have been considered.

Industrial Notes.

The Monterey Iron & Steel Company is reported to have discovered extensive deposits of coal in the course of exploration of lands leased by the company, situated near Barroteran, in the State of Coahuila.

The Mexican National Railway Company is about to make large additions to its rolling stock and will place orders soon in the United States for several hundred box cars and a number of baggage and express cars. Work will be commenced shortly upon extensive additional equipment needed, in the shape of gondolas, flat cars and cabooses.

Francisco C. Garcia has been granted a concession to use for irrigation the waters of the Duero River, in the State of Michvacan. The water is to be distributed over lands in the haciendas Santiaguillo and Rinconada. Applications for concessions have been made by Frumencio

Fuentes, who would use the waters of the River Nazas to irrigate the hacienda Rubio, in the State of Coahuila, and by Maclovio Gamboa, who desires to utilize the waterfall of the Conchos River, near La Olla, in the State of Chihuahua, for motive power purposes. A number of farmers of Tula, in the State of Hidalgo, ask for permission to use water from the Rio de la Tula for the irrigation of an extensive body of land in the neighborhood of the town named.

Consolidation of Nail Manufacturers.

Following an agreement entered into a few days ago, several of the factories in the southern section of the country engaged in the manufacture of wire nails will close shortly, and the trade of the districts in which they have operated will be supplied from the plant which will be kept working in San Luis Potosi. This is one of the first instances to be noted in Mexico wherein the principle of consolidation has been adopted by manufacturers in order to conserve their general interests and overcome the evils incidental to unreasoning competition.

In the *Monterey News*, of March 15, the following particulars were given in regard to the amalgamation and the causes leading to it:

By the combining of all the nail factories in the Republic except the one in Monterey, a commercial coalition has been formed which some persons say will control the whole nail industry of the central and southern part of the Republic. According to what was learned of the combine yesterday it will not affect the Monterey nail factory to any extent, because it is generally conceded that the Monterey establishment has by far the best territory of all and that it has the advantage of making its own wire and supplying it to the other factories.

The factories that have entered into the deal are La Palma nail factory of Guadalajara, run by Paulson & Co.; the Valentine and Emilio Elcero nail factory of Mexico City, and Deutz Brothers of San Luis Potosi. All three of the factories are big ones. Some months ago there were a great many improvements and additions made to the Deutz factory, and a short time after they were completed it became known that arrangements were on hand to combine the capital of the three companies in one.

A few days later the *Mexican Herald*, of the capital, after stating that a meeting of the nail manufacturers had been held to form a combination, referred to the matter in the following terms:

On April 1 the nail factories in this city and at Guadalajara will close down and only the San Luis Potosi plant will in future be operated, in addition to one at Monterey, which while not in the deal in the sense that the others are and to the extent of shutting down its plant, will still abide by the agreement formed at the meeting not to invade the market controlled by the three other factories. On the other hand, the three other factories mentioned agree to respect the rights of the Monterey factory in the latter's district, and they will therefore confine their business mainly to the southern half of the Republic. As the Monterey factory is the only one of the four in Mexico that manufactures wire it will be allowed to sell this product anywhere in the Republic.

It will be interesting to observe the consequences of this arrangement.

J. J. D.

Illinois Steel Company Improvements at Gary.

While the plans for the new plant of the Illinois Steel Company, Chicago, to be erected at Gary, Ind., are still in an embryonic state it has been practically decided to proceed with the erection of four blast furnaces and the necessary ore and coke bins and ore handling equipment. Bids are now being considered for the erection of the furnaces and stoves as well as the docks and the necessary ore handling machinery. Nothing definite has yet been decided as to the extent of the open hearth plant that will be proceeded with immediately. A minimum of 12 50-ton open hearth furnaces has been practically agreed upon, although the plans may be changed and either 18 or 24 erected. Engineers are now at work locating the lines of the harbor that will be built at this place, and other preliminary work is also well under way. At Sharon, Pa., tests are being made with a view to ascertaining the availability of coal from the Pocahontas fields in West Virginia for coking purposes in by-product ovens. If the tests prove successful the erection of a by-product plant will be proceeded with, so that the coke will be available upon the completion of the blast furnaces. No definite information is yet available regarding the other finishing mills that are to be installed.

NEWS OF THE WORKS.

Iron and Steel.

Edgar A. Welmer, inventor and designer of many blast furnace improvements; J. H. Weaver and others of Lebanon, Pa., have leased ground upon which they intend to build a small charcoal furnace to use concentrates or other pure ores in an endeavor to produce a grade of iron for very special uses.

The Parkersburg Iron & Steel Company, Parkersburg, W. Va., manufacturer of iron and steel sheets, is sending out to its friends pin trays made from its Acme polished sheet steel. A specialty made is its "Parkersburg Blue" steel sheets of the highest quality for deep stamping and other special purposes.

The Pennsylvania Swedish Iron Company, Pittsburgh, works at Cheswick, Pa., and maker of hammered charcoal iron, is considering the question of erecting a sheet mill, but has not yet come to a definite decision in the matter.

General Machinery.

The James Supply Company is the name of a new organization at Chattanooga which has applied for a charter with \$100,000 capital stock. It is to become the successor to C. E. James & Co., who are now operating a large business in the James Building on Market street. The incorporators of the new company are: Herbert Bushnell, M. Chamberlain, D. S. Henderson, O. K. LeBron and W. E. Mills. It is stated that as soon as C. E. James returns from the East his business will be turned over to the new company and the new organization will be perfected. James & Co. are among the oldest concerns in East Tennessee who deal in railroad machinery, engines, boilers and mill supplies.

The Jellico Machine & Foundry Company, Jellico, Tenn., has begun work on its plant and will push it to completion. It proposes to do general repairing of all light and heavy machinery and to manufacture a line of stoves.

The South Penn Oil Company, Pittsburgh, Pa., intends to erect new shops at Clarksburg, W. Va., this summer.

The New York Second-hand Machinery Company, Guthrie, Okla., and New York, has incorporated with a capital stock of \$50,000. The incorporators are Wm. A. Tobia and Richard Siegner of New York and H. W. Pentecost of Guthrie.

Swarthmore College, Swarthmore, Pa., is building a new \$20,000 shop into which will be moved the equipment from its present shops.

So far as has been ascertained, the recent fire at the plant of the Dreses Machine Tool Company, Cincinnati, Ohio, destroyed all the machines in its milling and gear cutting departments, and this equipment will have to be entirely replaced. The company has secured a temporary plant with 25,000 square feet of floor space, equipped with power, heating and lighting plants, where it will remain until it has secured a suitable site for rebuilding. Not having been able to settle with the insurance companies, the company has not yet been able to ascertain its entire loss of equipment.

The Puget Sound Dry Dock & Machine Company, Tacoma, Wash., will rebuild its machine shops, which were recently destroyed by fire. Only a small portion of the large tools were damaged, and the company is not in the market for new tools at the present time. A Detroit & Harvey 44-inch open side planer was destroyed and it will be replaced.

The Oregon Water Power & Railway Company, Portland, Ore., intends to construct additional shops, which will be operated by electricity. The equipment has been secured.

Among the recent contracts taken by the Buffalo Forge Company, Buffalo, N. Y., are the following: Complete equipment of fans, exhausters, motors and forges to the University of Pennsylvania, Philadelphia, Pa.; 13 forges to the College of the City of New York; complete equipment of blowers, exhausters and forges to the Cadillac Motor Car Company, Detroit, Mich.; Buffalo fan system of heating and ventilating, Illinois Steel Company, South Chicago, Ill.; complete heating and ventilating plant of fans, engines and heaters, also Buffalo air washer, controlling humidity and cleanliness of air, Carnegie Branch Library, St. Louis, Mo.; 170-inch fan and equipment to the Providence Retreat Hospital, Buffalo, N. Y.; complete heating and ventilating plant for Ann Arbor High School, Ann Arbor, Mich.; Buffalo lumber dry kilns—Sills & Klutz Lumber Company, Concord, N. C.; Norwood Lumber Company, Norwood, N. C.; York Furniture Company, Concord, N. C.; Buffalo steam engines—General Chemical Company, New York, and a tandem compound to Mahomet Mills, New Bedford, Mass.

A. V. Kaiser & Co., dealers in new and second-hand machinery, Philadelphia, Pa., have just purchased from the Cumberland & Pennsylvania Railroad two 19 x 22 inch eight-wheel switch engines and are still in the market for eight or nine standard gauge six or eight wheel switch engines, 18, 19 or 20 x 22 or 24 inches, with total wheel base of engine not to exceed 11 feet 6 inches.

Power Plant Equipment.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has received through its Atlanta office a very large order for electric machinery from the Southern Power Company, Fort Lawn, S. C. The order includes eight 3000-kw. generators for

direct connection to water wheels; two 250-volt exciters, and 12 2000-kw. oil insulated water cooled transformers. Through the Philadelphia office an order has been received from the Wilkes-Barre & Hazleton Railway for two turbine type generators of 1000-kw. capacity, to operate at an electromotive force of 300 volts.

The Hetsler Company, which has absorbed the interests of the Hetsler Pumping Engine Company, Pittsburgh and Erie, Pa., is unusually crowded with work in its new plant, which is located at St. Marys, Ohio, where it has a most modern and up to date machine shop, provided with large electric traveling crane and new tools especially adapted to its line of work. The company manufactures a complete line of high grade pumping machinery, including the well-known Hetsler vertical compensating type, which is used for water works, elevator and boiler feed service, also crank and fly wheel pumping engines, surface and barometric condensers, wet and dry vacuum pumps, power pumps, air compressors, and in fact a complete line of modern pumping machinery. The company has recently filled some large orders for Swift & Co., consisting of four 3,000,000-gallon high pressure boiler feed and fire pumps, and one 6,000,000-gallon crank and fly wheel circulating pump, also an 8,000,000-gallon crank and fly wheel pump for the Inland Steel Company, Indiana Harbor, Ind.; two 4,000,000-gallon pumps for Swift & Co., and two crank and fly wheel brine circulating pumps for the Nelson-Morris Company, and a number of other large contracts for this summer's delivery.

The Mechanical Appliance Company, Milwaukee, Wis., manufacturer of electrical apparatus, has increased its capital stock from \$100,000 to \$150,000. The company has recently been erecting a new plant at 133 Stewart street and is now occupying a part of it and increasing its output materially. About 100 men are employed in the manufacture of small electric motors and generators. Louis Allis is president and F. H. Petrie secretary.

Recent contracts taken by the Buffalo Steam Pump Company, Buffalo, N. Y., include the following installations of especial interest: Buffalo steam and power pumps—One 12 x 7 x 12 inch duplex to Ahmedabad, India; four boiler feed pumps to the Texas Mfg. Company, Fort Worth, Texas; three large duplex to the Havana Coal Company. Buffalo centrifugal pumps—One 14-inch two-stage to a large sugar refinery in the Hawaiian Islands; one 10-inch composition mine pump to the coal department of the Delaware & Hudson Company, Carbondale, Pa.; one 3-inch two-stage turbine pump to the Clinton Mills, Clinton, S. C.

The Memphis Street Railway Company, Memphis, Tenn., has purchased property at a cost of \$25,000 on which it will erect an addition to its power, the addition to accommodate a 200-kw. unit and boiler.

The Eagle River Electric Power Company, of which J. K. Romig of Baker City, Ore., is manager, will erect a 1200-kw. hydro-electric power plant on the Eagle River, near Sanger, to supply power to mines.

The Greenville Water Power Company, Emporia, Va., will soon ask bids for the construction of a 4000 horse-power plant on the Meherrin River. We are informed that this work will probably be placed in the hands of C. P. E. Burgulin, an expert engineer, and after specifications have been made up by him bids will be received for the development of the power and the installation of the machinery.

A petition in bankruptcy has been filed against the Universal Kerosene Engine Company, New York.

The Department of Water Supply, Gas and Electricity, New York, will receive bids until April 11 for a temporary boiler plant for the Ridgewood pumping station.

Randolf Lawrence, Roff, Ind. Ter., will receive bids until April 24 for the construction of a water works system for that town. There will be required boilers, pumps, boiler feed pumps, heater, &c.

During March the Westinghouse Machine Company received orders at its East Pittsburgh works for 19 Westinghouse-Parsons steam turbines aggregating 33,000 horse-power for each working day in the month. These orders came from all parts of the country, some of the more important being from the Delaware, Lackawanna & Western Railroad, New York; Northern Heating & Electric Company, St. Paul, Minn.; Public Service Corporation, New Jersey; municipality of Burlington, Vt.; Detroit, Munroe & Toledo Short Line Railway Company, Oak Park Construction Company, Oak Park, Ill.; American Rio Grande Land & Irrigation Company, Lonsboro, Texas; Rosemary Mfg. Company, Roanoke Rapids, N. C., and the Columbia Improvement Company, Boston, Mass.

Foundries.

The Hofeller Smelting & Refining Company has been incorporated at Buffalo, N. Y., to manufacture steel, brass and aluminum castings, &c. Capital stock is \$20,000. Incorporators are Theodore, Julius and Eugene D. Hofeller and Joseph Kuhn.

The Arcade Mfg. Company, Freeport, Ill., has closed contracts for the erection of a brass foundry, which will be of brick and cement construction, 50 x 80 feet, and a gray iron foundry, 65 x 200 feet. These buildings will provide twice the foundry capacity and will permit the execution of orders much more promptly than in the past. It is expected to have the buildings in commission by July 1.

Stuart R. Carr & Co., Baltimore, Md., have awarded contract for the construction of an addition to their plant, 42 x 100 feet, to be used as a core room. No new machinery is required.

The Challingsworth Foundry & Machine Company, Mt. Vernon, Ohio, has completed the erection of a large foundry equipped with electric traveling cranes and the latest and best machinery, and is now prepared to furnish iron castings up to 50,000 pounds, also brass and bearing metal castings. The company will shortly be prepared to furnish castings from air furnace iron and from air furnace semisteel. H. C. Challingsworth, vice-president and general manager, was formerly connected with the C. & G. Cooper Company, and previous to that connection had charge of the foundry at the Government Arsenal, Watertown, Mass.

The Ensign Foundry Company, Toledo, Ohio, has recently built a large addition to its plant, which has been equipped with machinery for the manufacture of soil pipe and soil pipe fittings. The company will be in position to fill orders for these goods in a very short time.

The Pacific Jupiter Steel Company, San Francisco, Cal., is about to install another acid open hearth steel furnace. The plant is now equipped with one 10-gross ton acid furnace. The new furnace will have a capacity of 15 tons. Machinery castings are made.

Fires.

The plant of the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, was burned April 2, the loss being estimated at \$100,000.

The smelting, concentrating and power plants of the Penn Wyoming Copper Company, at Grand Encampment, Wyo., were almost totally destroyed by fire last week. The loss is placed at \$300,000.

The power house and barn of the Schuylkill Railway at Girardville, Pa., were destroyed by fire April 3, with a loss of \$50,000.

The large building of the Foster Brothers Mfg. Company, Utica, N. Y., devoted to the manufacture of iron beds and spring mattresses, was destroyed by fire April 3. The loss is placed at \$200,000.

Bridges and Buildings.

The city of Woonsocket, R. I., is considering the erection of a \$12,000 steel bridge, spanning the tracks of the New York, New Haven & Hartford Railroad.

The Belmont Iron Works, Incorporated, Philadelphia, Pa., has recently taken orders for a large amount of bridge and structural iron and steel work, and has business enough in hand to insure the continuous operation of its local plant as well as its new bridge and structural plant at Eddystone, Pa. Some of the important work in hand includes a large structural job for the Pennsylvania Salt Company, Philadelphia; bridge work for the Pennsylvania and New York Central railroad companies; an electrical railroad building near Richmond, Va.; overhead crossing bridges for the new electric road of the West Jersey & Seashore Railroad near Atlantic City, and a number of car frames of special design for cars of 100 tons capacity. A large locomotive turntable has been shipped to a Southern railroad company, as has also a varied class of work for customers in different localities.

Hardware.

The Oliver Chilled Plow Works, South Bend, Ind., has awarded contracts for the erection of a new five-story steel and concrete warehouse, 100 x 250 feet. The building will be fitted out with all modern conveniences for the expeditious and economical handling of goods, and it is expected will be ready for occupancy by August 1. Other important additions are in contemplation.

The Wapakoneta Hollow Ware Company, Wapakoneta, Ohio, has let the contract for an additional building to its present plant. It will be a brick structure, three stories, 60 x 60 feet. The new building will be used for the nickel plating department.

The Atlas Wire Fence & Post Company has secured temporary quarters on Water street near Cherry, Toledo, Ohio, and is now engaged in installing the necessary machinery for the production of wire fencing under the superintendence of F. C. Black. The company has been incorporated with a capital stock of \$50,000.

The Keystone Wire Matting Company, Beaver Falls, Pa., will build an addition to its plant. The new building will be two stories high, 32 x 48 feet, equipped with modern machinery for turning out wire mats and other wire goods.

Landers, Frary & Clark, New Britain, Conn., manufacturers of hardware, are to erect a new building to be devoted to a tinning room. It will be 75 x 140 feet, one story, with monitor roof. It will adjoin the new foundry building now in course of erection.

Miscellaneous.

The French Mfg. Company, Waterbury, Conn., recently incorporated, advises us that it is already manufacturing small sizes of brass and copper seamless tubing in its new factory. The officers of the company are Frederick W. French, president; L. R. Carter, secretary and treasurer.

The American Emery Wheel Works, Providence, R. I., has recently bought some 30,000 square feet of land adjoining its

present site and will soon erect a three-story addition to its plant.

The Buffalo Car Journal Box Company has been incorporated at Buffalo, N. Y., to manufacture patent car journal boxes, oil boxes, &c. Capital is \$100,000. Directors are J. O. Moore and J. Crumlish, Buffalo, and B. Z. Kassan, Gloversville, N. Y.

The H. & M. Automatic Regulator Company, Newark, N. J., recently incorporated, has acquired the patents and plant of the Davis & Roesch Temperature Controlling Company and will continue the business at the present location. The controlling interest in the new company is held by the Hohmann & Maurer Mfg. Company, Rochester, N. Y., and eventually the manufacturing will be done in the latter company's plant.

The Lebanon Chain Works, Lebanon, Pa., has purchased the large plants of the Empire and the Chilcote-Evans companies at Pittsburgh, Pa., which will be moved to Lebanon and combined with the present plant, making there the largest hand and machine making chain works in this country. The combined plants will have 200 fires.

The J. G. Brill Company, Philadelphia, Pa., has awarded contract for the construction of a new spring shop, 68 x 163 feet.

It is stated that the Lux Light Company of Stockholm, Sweden, has virtually decided to locate its American factory at Dunkirk, N. Y., and that about \$1,000,000 will be expended upon the construction and equipment of the plant. Pending the construction of the new plant the vacant plant of the American Air Tool Company at Dunkirk will be utilized. Gustav Berg of Stockholm, president of the company, now at Dunkirk, states that 200 men will be employed to begin with and that force eventually increased to 500. The company manufactures a lamp which produces its own supply of gas from vaporized kerosene oil while the lamp is burning, throwing out a powerful light, the cost of which is said to be less than one-fourth the cost of electricity. The Lux light is used extensively in Europe and the demand for it is daily becoming greater.

The George W. Severns Piano Action Company, Cambridge, Mass., is to erect a three-story factory building, 50 x 150 feet.

Thomas F. Jackson, Waterbury, Conn., manufacturer of stone work, is to erect a new manufacturing building 100 x 220 feet. He will install a 20-ton traveling derrick.

The Holbrook Mfg. Company, Attleboro, Mass., manufacturer of sheet metal work, special machines and novelties, has been incorporated in Massachusetts with capital stock of \$40,000, and these officers: President, Harry R. Holbrook; treasurer, Charles L. Holbrook; clerk, H. L. Leland; directors, these officers and A. J. Brander and Louis E. Flye.

The Waterbury Metal Company, Waterbury, Conn., manufacturer of German silver, brass and copper sheets, wire and rods, has changed its name to the Waterbury Rolling Mills, Incorporated.

The Pressed Steel Package Company, Canton, Ohio, is being formed by citizens of that place. It will be capitalized at \$250,000 and will manufacture metal boxes for shipping purposes. A. R. Speer of Pittsburgh is the inventor of the box.

Secretary of Agriculture Wilson says that scientific farming is now so much of a factor that serious crop failures in the United States are not to be feared. Farmers are now studying the soil and climatic conditions and choosing their crops accordingly. The agents of the Department of Agriculture have searched the world for crops best adapted to varying conditions in this country. "They have brought crops which blossom in the deserts, and now in the arid tracts in parts of the West crops are being produced where it was thought only rattlesnakes and lizards could thrive. What the Agricultural Department is attempting is to overcome the natural conditions. Where the growing seasons are usually dry and hot the farmer will not plant the corn or wheat which the farmer where more moisture is to be expected would use. Deep plowing, soil investigation, seed selection, improved machinery, all combine to assure the farmers at harvest time of a fair reward for their toil and outlay. There may and probably will be poor crops in certain counties, but we will not have what can be called crop failures."

Reports from power plants carrying a steady load are very favorable to the use of superheated steam, there being little trouble experienced where the systems are well arranged. When it is attempted, however, to utilize superheated steam with conditions involving sudden and large fluctuations of load, the result is an occasional excessive rise in temperature, with consequent trouble of all sorts with piping and valves. This has even caused havoc in steam turbines by reason of excessive expansion of some of the parts, with resultant binding.

The Pittsburgh Foundrymen's Association Entertains.

On Monday evening, April 2, the Pittsburgh Foundrymen's Association entertained as its guests members of the New England, Philadelphia, Erie and Cleveland foundrymen's associations. The visitors were thoroughly impressed with the hospitality of the Pittsburgh foundrymen and returned to their homes feeling that their visit to that city had been one of interest and profit and full of good fellowship. The foundrymen from Philadelphia turned out in good number, about 30 being present, while New England sent only 4, Cleveland 11 and Erie 3.

The guests were met on their arrival in Pittsburgh on Monday morning by an Entertainment Committee from the Pittsburgh Foundrymen's Association and a special train was boarded, the visitors being taken to the Homestead Steel Works, then to the works of the Westinghouse Electric & Mfg. Company and Westinghouse Machine Company at East Pittsburgh, and also to the large and modern foundry of the Westinghouse Company at Trafford City. The visitors returned to Pittsburgh in the evening fully satisfied that Pittsburgh has some of the finest and largest manufacturing plants to be found anywhere. The enormous size and the methods of handling material at the Homestead Steel Works of the Carnegie Steel Company particularly impressed the visitors, some of whom had never seen this plant before.

In the evening the guests were tendered a banquet by the Pittsburgh Foundrymen's Association in the large new banquet hall of the Colonial Annex Hotel and the affair was a most enjoyable one. The toastmaster was D. B. Fuller of the Westinghouse Electric & Mfg. Company, who is president of the Pittsburgh Foundrymen's Association. Addresses were made by Professor Connelly of the Carnegie Technical Schools, Bartlett M. Shaw of the Walker & Pratt Mfg. Company of Boston, H. M. Lane, editor of *The Foundry*; Dr. Richard Moldenke, secretary of the American Foundrymen's Association; Thomas D. West of the Thomas D. West Foundry Company, Sharpsville, Pa., and others. A vaudeville entertainment was also provided, which was much enjoyed. Dr. Moldenke and Mr. West stated in their addresses that liberal arrangements were being made for entertaining the members at the annual meeting of the American Foundrymen's Association, to be held in Cleveland in June, and it promises to be one of the best meetings in every way that has been held. A full list of the visitors is as follows:

CLEVELAND, OHIO.

U. E. Kanaval and H. E. Koontz, Interstate Sand Company.
Jas. A. Murphy and H. G. Davies, Interstate Foundry Company.
H. M. Lane, editor *The Foundry*.
W. B. Greene, Palmers & De Mooy Foundry Company.
Wm. Greenbaum, Acme Foundry Company.
Philip Frankel, secretary Cleveland Founders' Association.
J. S. Smith, J. D. Smith Foundry Supply Company.
Harwood Wilson, Rogers, Brown & Co.

ERIE, PA.

A. N. Bates, Erie Foundry Company.
Wm. F. Grunan and Elv Griswold, Erie City Iron Works.

PHILADELPHIA, PA.

Carl Rossmassler, Rossmassler-Baulne Electric Company.
August A. Miller, *The Iron Age*.
E. H. Mumford, E. H. Mumford Company.
E. E. Brown, Wilmer Krusen and Clarence Payne Franklin, E. E. Brown & Co.
W. B. Kennedy, Bethlehem Steel Company.
Geo. R. Sullivan, Rogers, Brown & Co.
F. Cooper Pullman of J. Wesley Pullman.
Louis J. McGrath, Thomas Devlin Mfg. Company.
Howard Evans, J. W. Parson Company.
Frank Krug, Joseph Dixon Crucible Company.
James A. Brown, consulting engineer, Frankford Arsenal.
Charles R. Day and Thos. G. Smith, Midvale Steel Company.
Richard H. Day, Day Brothers.
Charles C. Bacon, Ross-Tacony Crucible Company.
Thomas Evans, Eynon-Evans Mfg. Company.
Cyrus Borgner.
Otto W. Schaum, Schaum & Milinger.
Howard C. Matlack, Frank Samuels.
Stuart B. Marshall, L. & R. Wister & Co.
Philip C. Smith, Ingersoll-Rand Company.

FROM OTHER CITIES.

Harry D. Harvey, Monarch Engineering Company, Baltimore, Md.
F. B. Harkins, F. B. Harkins Foundry Company, Bristol, Pa.
Benj. Holt, Camden Foundry Company, Camden, N. J.

Walter S. Beckley, Penn Steel Casting & Machine Company, Chester, Pa.
W. L. Wright and Wm. J. Sherman, Bethlehem Steel Company, South Bethlehem, Pa.
Bartlett M. Shaw, Walker & Pratt Mfg. Company, Boston, Mass.
E. E. Durant, G. F. Warner Mfg. Company, New Haven, Conn.
Chas. J. Coley, Russell & Erwin Mfg. Company, New Britain, Conn.
Wm. J. Breen, Hugh W. Adams & Son, Boston, Mass.
P. S. Crawford, U. S. Graphite Company, Saginaw, Mich.
C. O. D. Blanchfield, American Manufacturer, San Francisco, Cal.
John J. Wilkins, Connersville Blower Company, Connersville, Ind.
Dr. R. Moldenke, Watchung, N. J.
C. E. Bell, C. B. Bell Company, Hillsboro, Ohio.
E. M. Ayers, Ayers Mineral Company, Zanesville, Ohio.

Extensions to the North Works of the Illinois Steel Company.

Warehousing facilities for handling shapes, plates and bars cut to length for structural purposes that will not be exceeded by any other plant in the world will be provided at the North Works of the Illinois Steel Company, Chicago, when extensions now under way are completed. The fitting shop and warehouse of this plant now have facilities for handling 60,000 tons of material annually, and with the extension facilities will be provided for 100,000 tons. Approximately 40,000 tons of bars, shapes and plates for structural purposes will constantly be carried in stock, as compared with 20,000 tons at present. The fitting shop, which has a monthly output of 1500 to 2000 tons, is not being extended, but on account of the constantly growing demand for material cut to length, not only from contractors and erectors but from builders of tools and appliances as well who are replacing wooden parts and castings with shapes, &c., the warehousing facilities are being increased.

By extensions to the main building approximately 60,000 square feet of additional floor space will be available, the extension to this building at one end being 50 x 190 feet in dimensions and the leans and extensions to the central span at the other end will be approximately 200 x 245 feet. The present templet shop will be razed and a new fireproof structure, 60 x 150 feet, erected in its place. A new office building, 40 x 150 feet, is also to be built. Five additional cranes of 10 tons' capacity, each provided with two trolleys, will be installed by the Whiting Foundry Equipment Company. Five 10-ton cranes are now in operation and were installed by the same concern. The cold cutting equipment will also be added to and the boiler capacity will be increased by the installation of 1200 horse-power by the Stirling Consolidated Boiler Company. With the completion of this extension beams and channels 75 feet in length will be carried in stock for cutting to requirements, whereas the longest sections that are now carried are 65 feet. Wm. H. Pratt is superintendent of the plant.

PERSONAL.

W. L. Slebert, assistant general manager of sales of rails and billets of the Carnegie Steel Company, Pittsburgh, has returned from an extended vacation in California.

W. C. Runyon, president of the Struthers Furnace Company, Struthers, Ohio, will sail for Europe in a short time to spend the summer.

Milton E. Coombs has resigned as general superintendent of the hoop mills of the Carnegie Steel Company in the Youngstown district. His successor has not yet been appointed.

Gorham C. Parker, formerly manager of the Superior Tap Company, Springfield, Vt., and later New England representative of the Pittsburgh Tool Steel Wire Company, Monaca, Pa., has resigned the latter position to accept the position as sales manager for the Jacobs Mfg. Company, Hartford, Conn.

The American Pig Iron Storage Warrant Company's stocks of pig iron declined from 35,300 tons on February 28 to 30,500 tons on March 31, deliveries in March having been 6400 tons and receipts 1600 tons.

The Iron and Metal Trades

There is a good deal of perplexity in the trade over the best course to pursue in view of the labor troubles in the bituminous and anthracite Coal fields. To the Iron trade at large the production of bituminous Coal is a much more important matter than the supply of anthracite. The Iron makers of the Central West, of the Chicago district, of the South and many producers on the lakes will draw their usual supplies from sections which will be mining at the usual rate. The anthracite furnaces, nearly all of which use a considerable part of Coke in their mixtures, will be somewhat embarrassed and may face a partial stoppage. To what extent this will be offset by a decline in the consumption as the result of Coal scarcity cannot be well determined so early.

It is understood that the Steel Corporation will run full, being completely taken care of.

There has been some buying of Pig Iron by Steel works and foundries as a protection against a protracted strike, but the movement has reached only moderate proportions. There has been more interest in the market, however, quite irrespective of this phase of the situation. The foundry trade is on the tiptoe of expectation over the outcome of the bids for 12,000 tons of Iron for the Westinghouse interests. There has been some inquiry for Malleable Pig in the Central West and some business has been closed, notably in St. Louis. In New York a lot of 5000 tons of Southern Iron has been placed, the first block of this magnitude for some months. Eastern Pipe foundries have taken some round lots of Virginia Irons.

The Steel Corporation has bought a little Bessemer Iron and is expected to purchase more soon for April requirements. The furnaces of the corporation have broken all records during March, having made in that month 1,001,226 tons, as compared with the best previous achievement, 947,476 tons, in October, 1905. The production of Bessemer and Open Hearth Steel Ingots, too, was greater in March than ever before. It amounted to 1,268,933 tons, as compared with the best previous record of 1,179,267 tons in January.

The Rail mills are under increasing pressure and it is becoming a serious problem how to arrange rolling sheets so as to meet deliveries far toward the end of the year. Reports are current that at least one large system is seeking relief by turning to foreign Rail makers, hopeless though that step may seem. During the past week sales have aggregated about 35,000 tons in moderate sized lots.

The Structural mills are crowded and some very good business is coming up. There are now in the market four railroads whose aggregate requirements of Bridge work foot up to 25,000 tons.

An interesting estimate is that the new Steel plant at Gary, Ind., will require about 100,000 tons of Structural Material in all. The contracts for the material for four blast furnaces for the Ore docks and for the Ore bins for this plant are to be let at an early date.

The new Structural mill of Jones & Laughlin is expected to start within a short time. It has a capacity of 8000 tons of medium sizes per month.

After a protracted meeting last week the manufacturers of Steel Bars have reaffirmed prices. It is understood, however, that an adjustment on season contracts has been made with agricultural implement makers.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 4, 1906.	Mar. 28, 1906.	Mar. 7, 1906.	Apr. 5, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	\$18.25	\$18.25	\$18.50	\$17.50
Foundry No. 2 Southern, Cincinnati	16.50	16.50	17.00	16.25
Foundry No. 2, Local, Chicago ..	18.75	19.00	19.00	17.25
Bessemer, Pittsburgh	18.20	18.25	18.35	16.35
Gray Forge, Pittsburgh	16.60	16.85	16.85	16.00
Lake Superior Charcoal, Chicago	19.50	19.75	19.75	18.50

BILLETS, RAILS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	27.00	27.00	26.50	24.00
Forging Billets, Pittsburgh	32.00	32.00	32.00	27.00
Open Hearth Billets, Phila.	29.00	29.00	29.00	28.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	13.50	13.50	15.00	15.25
O. Steel Rails, Philadelphia	17.00	17.00	16.25	18.00
O. Iron Rails, Chicago	20.50	20.50	21.50	20.00
O. Iron Rails, Philadelphia	21.50	21.50	20.50	25.00
O. Car Wheels, Chicago	18.00	18.00	19.00	16.00
O. Car Wheels, Philadelphia	16.75	17.00	18.00	17.00
Heavy Steel Scrap, Pittsburgh ..	11.50	14.50	14.75	16.00
Heavy Steel Scrap, Chicago	13.50	13.50	13.00	14.75

FINISHED IRON AND STEEL, Per Pound:				
Refined Iron Bars, Philadelphia ..	1.73½	1.73½	1.73½	1.73½
Common Iron Bars, Chicago	1.71½	1.71½	1.75	1.60
Common Iron Bars, Pittsburgh ..	1.60	1.60	1.80	1.65
Steel Bars, Tidewater, New York ..	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York ..	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh ..	1.57½	1.57½	1.57½	1.65
Skelp, Sheared Steel, Pittsburgh ..	1.60	1.60	1.60	1.70

SHEETS, NAILS AND WIRE, Per Pound:				
Sheets, No. 27, Pittsburgh	2.25	2.25	2.30	2.30
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25

METALS, Per Pound:				
Copper, New York	18.62½	18.62½	18.37½	15.25
Spelter, St. Louis	6.60	6.05	6.05	5.75
Lead, New York	5.35	5.35	5.35	4.50
Lead, St. Louis	5.35	5.27½	5.27½	4.47½
Tin, New York	38.25	37.45	35.80	30.20
Antimony, Hallett, New York ..	18.00	17.00	15.25	8.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	\$3.60	\$3.69	\$3.69	\$3.74

Chicago.

FISHER BUILDING, April 4, 1906.—(By Telegraph.)

Effective July 1, the United States Steel Corporation has announced the removal of the differential of \$1 a ton on direct mill shipments of Structural Shapes, Plates and Bars heretofore allowed large distributors. This action was taken with a view of diverting this tonnage directly to the corporation mills, although it is in no way intended to interfere with the warehousing and jobbing of such products. This move has been considered by the corporation at various times since its organization, but definite action was as often deferred, and for this reason the removal of the differential at this time was the more unexpected. Whether this action will result in affiliations with independent producers of Shapes, Plates and Bars has not yet developed, although it is logical to conclude that such connections will follow to enable these distributors to maintain their relations with such large consumers as they have served directly from the mill and continue to serve with these products. The reaffirmation of Steel Bar quotations at Pittsburgh last week has retarded the placing of large orders by implement interests whose contracts have expired and they are buying concurrently for immediate needs, and will await developments in the next two or three months before closing for future requirements. The buying of agricultural shapes will also be deferred, although implement makers are anxious to cover, providing prices satisfactory to them would be named. The erection of the new Steel plant at Gary, Ind., will require approximately 100,000 tons of Plates and Shapes, and work on the erection of Ore docks, Ore handling machinery and

bins for four blast furnaces will soon be under way. All structural work will be done by the American Bridge Company. For the new mill buildings at the South Works the North Works of the Illinois Steel Company is fitting 10,000 tons of material. The warehousing facilities of the latter for Plates, Bars and Shapes for structural purposes are being increased to 100,000 tons annually, and the additions will provide room for carrying a stock of from 35,000 to 40,000 tons constantly on hand. With the recent avalanche of Rail orders Western roads have practically concluded purchases for this year's requirements, and the Lackawanna Steel Company this week acknowledged that it can book no further tonnage for this year's delivery. The Illinois Steel Company has been out of the market for some time and the Carnegie Steel Company has only a small tonnage available. The demand for Relaying Rails is consequently heavy and Sections 60 lbs. and heavier in large lots readily command \$29 to \$30. The Coal strike has had apparently no effect on the Western Iron and Steel trade, and manufacturers generally are carrying stocks of fuel sufficient for 60 days' consumption. Contracts for upward of 10,000 tons of Cast Iron Pipe were closed by gas companies during the week, but the only municipal letting of note was made by the city of Cleveland for 1100 tons. The contract for the Steel for the Syndicate Annex Building, St. Louis, has not yet been awarded. The McClintic-Marshall Construction Company, Pittsburgh, will erect a new merchant mill building for the International Harvester Company at South Chicago, requiring 800 tons of Steel.

Pig Iron.—Western malleable interests have made tentative inquiries during the past week for round lots ranging from 1000 to 2000 tons, but as yet no contracts have been closed. At St. Louis one malleable interest is reported to have purchased 2500 tons for second quarter delivery, at a price considerably lower than has prevailed recently. Northern furnaces have also reduced their quotations slightly, and one producer made a quotation of \$18.80 Chicago during the week. We note the sale of 1000 tons of No. 2 Southern Iron, for April, May and June shipment, at \$13.75 Birmingham. This price is now being made more freely, and consumers that have recently tested the market are willing to close at a concession of 25c. The demand for spot material continues insistent, indicating that the foundries have only small stocks and will make purchases as soon as prices are down to a level that will meet their views. Prevailing quotations, f.o.b. Chicago, are as follows:

Lake Superior Charcoal.....	\$19.50 to \$19.75
Northern Coke Foundry, No. 1.....	19.25 to 19.50
Northern Coke Foundry, No. 2.....	18.75 to 19.00
Northern Coke Foundry, No. 3.....	18.25 to 18.50
Northern Scotch, No. 1.....	19.80 to 20.00
Ohio Strong Softeners, No. 1.....	19.80 to 20.05
Ohio Strong Softeners, No. 2.....	19.30 to 19.55
Southern Coke, No. 1.....	18.25 to 18.40
Southern Coke, No. 2.....	17.65 to 17.90
Southern Coke, No. 3.....	17.15 to 17.40
Southern Coke, No. 4.....	16.65 to 16.90
Southern Coke, No. 1 Soft.....	18.15 to 18.40
Southern Coke, No. 2 Soft.....	17.65 to 17.90
Southern Gray Forge and Mottled.....	16.15 to 16.40
Malleable Bessemer.....	19.00 to 19.25
Standard Bessemer.....	19.30 to 19.55
Jackson Co. and Kentucky Silvery, 6 %.....	21.30
Jackson Co. and Kentucky Silvery, 8 %.....	23.30
Jackson Co. and Kentucky Silvery, 10 %.....	25.30

Metals.—Speculative influences continue at work on Pig Tin, the market having advanced fully ¼c. Copper is strong, with the tendency upward. We quote: Casting Copper, 18½c. to 18¾c.; Lake, 18½c. to 19c.; Pig Tin, car lots, 38¾c. to 39c.; small lots, 39¼c. to 39¾c.; Spelter, prompt delivery, 6½c. to 6¾c. for car lots; Lead, Desilverized, 5.45c. to 5.70c. for 50-ton lots; Corroding, 6c. to 6.25c. for 50-ton lots; on car lots, 2¼c. per 100 lbs. higher; Sheet Zinc is \$7.75 list, f.o.b. LaSelle in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 16c.; Heavy Copper, 15½c.; Copper Bottoms, 14¾c.; Copper Clips, 15½c.; Red Brass, 15c.; Red Brass Borings, 13c.; Yellow Brass, Heavy, 12c.; Yellow Brass Borings, 10c.; Light Brass, 8¾c.; Lead Pipe, 4¾c.; Tea Lead, 4¼c.; Zinc, 4¾c.; Pewter, No. 1, 24c.; Tin Foil, 20c.; Block Tin Pipe, 27½c.

Coke.—The Coke market has been more active during the week, the buying being influenced largely by the threatened shortage of fuel, on account of the coal strike. Prices are somewhat firmer, but no advances of importance have been made. Strictly high grade Connellsville Foundry Coke is still quoted at \$3.15 at the ovens, or \$5.80 Chicago, and sales of By-Product Coke on contracts running through the remainder of the first half of the year have been made on the basis of \$5.65 to \$5.85, f.o.b. Chicago.

(By Mail.)

Billets and Rods.—The American Steel & Wire Company has advanced its prices on both Basic and Bessemer Rods to \$34, Pittsburgh, equivalent to \$37, Chicago. This advance was no doubt influenced by the marking up of Billets \$2 a ton by the Carnegie Steel Company, effective April 2. Forging Billets still continue scarce and are held at prohibitive prices, small lots selling as high as \$36 to \$37. Some of the large Western consumers are already figuring on requirements during the second half of the year, but as yet no quotations have been made by any of the mills.

Rails and Track Supplies.—On account of the Coal strike the demand for Light Rails has fallen off materially, although the Illinois Steel Company has orders on its books that will insure operations during the next three months. No large contracts were placed by any of the Western roads during the week, as practically all of the heavy buying has been done. Spikes for prompt delivery are quoted at prices ranging from 2.10c. to 2.25c., although for delivery during the second half of the year 2.05c. is named. Quotations are unchanged, as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.05c. to 2.10c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$27 to \$28; 25-lb., \$29; 20-lb., \$29 to \$30; 16-lb., \$30 to \$31; 12-lb., \$31 to \$32, and lighter sections down to 8-lb., \$38 to \$40, f.o.b. mill. Standard Sections are unchanged, at \$28, f.o.b. mill, full freight to destination.

Structural Material.—The North Works of the Illinois Steel Company is now working on an order of 10,000 tons for new buildings to be erected at the South Works. This order was placed some time ago. Bids are now being asked by the Illinois Steel Company for the erection of Ore docks and bins at Gary, Ind., to meet the requirements of four blast furnaces, and it is probable that this work will be done by the American Bridge Company. Although nothing definite is available as to the tonnage required in the erection of the new plant at Gary, it is estimated that approximately 100,000 tons of Plates and Structural Shapes will be used in the erection of the mills, power plants and blast furnaces. Extensions are now being made at the North Works of the Illinois Steel Company, which will practically double its capacity for handling Shapes, Plates and Bars cut to lengths for Structural work. The fitting department is, however, not being extended. When the improvements are completed the capacity of the plant will be about 100,000 tons a year, and it is aimed to carry a stock of Shapes, Plates and Bars of about 40,000 tons constantly on hand. Specifications for the new building of the Chicago Telephone Company have been issued and contract will probably be let shortly. Twenty-five hundred tons of Steel will be required. Stock material continues in good demand, although erectors are not as insistent for prompt deliveries as they were some time ago. Quotations are now uniformly on the basis of 2.25c. Mill quotations remain unchanged as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼ inch and heavier, 1.86½c.; Angles, larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—Western mills report the receipt of heavy specifications this week from large distributors catering to the boiler trade. New tonnage, however, continues extremely light, and all of the mills are in position to make deliveries within two weeks. Quotations are firm and unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16-inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16-inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8, up to 60 inches wide, 2.15c. to 2.25c.; Flange and Head quality, 25c. extra.

Sheets.—Some of the independent mills are now quoting 2.30c. for 28-gauge Black Sheets, and on practically all of the lighter sizes the official quotations of the leading interests are being shaded \$2 a ton. There is also an unevenness of quotations made by some of the large distributors, no doubt due to the low prices at which they are receiving material, these contracts having been closed about six months ago, on a basis of 2.10c. to 2.20c. We make the following quotations: Blue Annealed, Nos. 9 and 10, 1.86½c. to 1.91½c.; Nos. 16 and 17, 2.06½c. to 2.11½c.; Box Annealed, Nos. 18 to 20, 2.26½c. to 2.31½c.; No. 27, 2.46½c. to 2.51½c.; No. 28, 2.56½c. to 2.61½c.; Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 17 to 21, 2.86½c.; Nos. 22 to 24, 3.01½c.; Nos. 25 and 26, 3.21½c.; No. 27, 3.41½c.; No. 28, 3.61½c.; No. 30, 4.11½c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c. Box Annealed, Nos. 18 to 20, 2.50c. to 2.55c.; Nos. 22 to 24, 2.55c. to 2.60c.; No. 26, 2.60c. to 2.65c.; No. 27, 2.65c. to 2.70c.; No. 28, 2.75c. to 2.80c.; No. 30, 3.15c. to 3.20c. Galvanized from store: Nos. 10 to 20, 3c. to 3.05c.; Nos. 22 to 24, 3.15c. to 3.20c.; No. 26, 3.35c. to 3.40c.; No. 27, 3.55c. to 3.60c.; No. 28, 3.75c. to 3.80c.; No. 30, 4.95c. to 5c.

Bars.—At the meeting of the Steel Bar manufacturers held in Pittsburgh last week prevailing quotations were re-

affirmed, and as a result of this action none of the large Western implement makers that was ready to close contracts dating from April 1 will cover future requirements. These consumers are now buying concurrently on the present basis and will await further developments before placing their contracts. Iron Bars continue to be uniformly held at 1.71½c., Chicago, notwithstanding the lower prices that are being quoted in some of the Eastern markets. We revise quotations as follows: Iron Bars, 1.71½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—Specifications are coming in freely and while new business is comparatively light, large jobbers are taking the material for which they contracted shortly before the first of the year. Quotations still remain on the basis of 81 per cent. off the list, Pittsburgh, while official discounts on car lots, Chicago, remain unchanged, as follows: Black Steel Pipe, 78.35 per cent. on the base sizes ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—Competition on the new tonnage that is offered is very keen, indicating that not all of the mills have very large tonnage before them. Prices, however, are on a comparatively low basis, and are consequently fairly well maintained. Official discounts, base sizes, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2½-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2½ inches.....	50	35	35
2½ inches.....	52½	35	30
2½ to 3 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

Merchant Steel.—The action taken by the Steel Bar Association in Pittsburgh last week will largely govern the future action of the manufacturers of Agricultural Shapes, and prices will remain unchanged for the present at least. Specifications continue heavy, notwithstanding the absence of new business. Quotations are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ¾ and 1 inch, 2c., and 1½ inch and larger, 1.90c., Pittsburgh; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount on car lots and 45 per cent. in less than car lots, in base territory.

Cast Iron Pipe.—Western gas manufacturers have placed heavy contracts with the United States Cast Iron Pipe & Foundry Company during the week, the total aggregating 10,000 tons. This company was also awarded the contract for 1100 tons of Water Pipe by the city of Cleveland. The city of Hattiesburg, Miss., will close shortly for 650 tons of Water Pipe, while the city of Cincinnati is in the market for 500 tons. We quote as follows: Water Pipe, 4-inch, \$31; 6, 8, 10 and 12 inch, \$30; over 12-inch, \$29, with \$1 extra for Gas Pipe. Large municipal contracts are usually placed at somewhat lower basis.

Old Materials.—Heavy melting stock is somewhat stronger, although no change has been made in prevailing quotations. This is probably due to the heavy buying in this market during the past ten days, as some of the Steel interests have been purchasing heavily, believing that the coal strike would curtail Pig Iron production. Wrought Scrap, Turnings and Bushelings are weaker and lower prices have been made during the week. The demand for Relaying Rails is very heavy and it is practically impossible to secure sections of 60 lbs. and heavier, as the railroads are largely withholding this material and are using the Rails for side tracks, &c. The railroad lists continue comparatively light and it is believed that a reaction in the market is soon to take place. The range of prices paid by large consumers to producers and dealers, per gross ton, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails.....	\$20.50 to \$21.00
Old Steel Rails, 4 feet and over.....	15.50 to 16.00
Old Steel Rails, less than 4 feet.....	13.50 to 14.00
Heavy Relaying Rails, subject to inspection.....	27.00 to 27.50
Old Car Wheels.....	18.00 to 19.00
Heavy Melting Steel Scrap.....	13.50 to 14.00
Frogs, Switches and Guards.....	13.50 to 14.00
Mixed Steel.....	12.00 to 12.50

The following quotations are per net ton:

Iron Fish Plates.....	\$15.50 to \$16.00
Iron Car Axles.....	22.00 to 22.50
Steel Car Axles.....	18.00 to 18.50

No. 1 Railroad Wrought.....	14.50 to 15.00
No. 2 Railroad Wrought.....	13.50 to 14.00
Locomotive Tires, smooth.....	14.00 to 14.50
Railway Springs.....	13.50 to 14.00
No. 1 Dealers' Forge.....	11.50 to 12.00
Mixed Busheling.....	9.00 to 9.50
Iron Axle Turnings.....	11.00
Soft Steel Axle Turnings.....	11.00
Machine Shop Turnings.....	11.00
Cast Borings.....	8.50 to 9.00
Mixed Borings, &c.....	8.50 to 9.00
No. 1 Mill.....	8.50 to 9.00
No. 2 Mill.....	7.50 to 8.00
No. 1 Boilers, cut to Sheets and Rings.....	9.50 to 10.00
No. 1 Cast Scrap.....	12.50 to 13.00
Stove Plate and Light Cast Scrap.....	10.50 to 11.00
Railroad Malleable.....	13.00 to 13.50
Agricultural Malleable.....	12.00 to 12.50

The M. A. Purvin Company, dealer in Iron and Steel products, recently organized in Chicago, has opened an office on the fourteenth floor of the Monadnock Building, with M. A. Purvin as active manager. Mr. Purvin has been engaged in the Iron and Steel business and kindred lines for the past 16 years and is well known to the trade throughout the West and Northwest. He has already secured the lines of a number of prominent Eastern mills, including Wrought Iron Pipe, Plates, Rivets and Steel Castings.

Philadelphia.

REAL ESTATE TRUST BUILDING, April 3, 1906.

It is almost impossible to write a report of the Iron trade which will be in any degree satisfactory under prevailing conditions. All that is clear is that an enormous lot of business would be waiting acceptance providing that the situation was normal, but as matters stand to-day neither producer or consumer seems to know what he is up against. The hope and the belief are, however, that things are not as bad as they seem and that in a very little while normal conditions will prevail. As regards the present, the demand for pretty much everything on the list is very strong, while the supply for early delivery is extremely limited. Apart from a genuine scarcity, there is also a desire for protection against the possibility of a protracted strike, and as the difficulties arising from strike conditions would affect producers as well as consumers they also desire all the protection they can get. It is obvious, therefore, that the trading end is a most difficult proposition. How much to sell, what price to quote or whether to sell at all is the problem for sellers, while from the buying standpoint similar considerations have to be dealt with. It is already apparent that consumption will be checked, as both the Pennsylvania and Reading railroad companies have laid off a large number of men in their shops, while in the Anthracite regions closing down in many of the Iron industries is very general. It is therefore rather probable that eastern Pennsylvania, New Jersey and adjoining districts will be greater sufferers than more remote points, and, as previously stated, it is already felt in quite a number of cases. For the present quotations are in all cases about the same as last week, but whether any large tonnage would or could be sold (or bought) is a question.

Pig Iron.—The Pig Iron situation cannot be defined with any degree of confidence, although in a general way it is considered that prices are unchanged. There are a great many inquiries for Pig Iron, however, and some quite large sales of the lower grades have been made, while for Foundry Irons consumers show more disposition to place orders than they have for a long time past. How much of this may be due to fears of scarcity and how much to actual needs is uncertain, although a great many small orders are being placed, and quick shipments are desired both on new business and old. Makers are not encouraging purchases, however, and beyond taking care of their regular trade, they are not anxious for business. If the strike assumes the importance which is claimed for it it would cause considerable disarrangement in almost all lines of business, but the consensus of opinion is that the strikers are in no condition to hold out for any length of time and that an arrangement may be made at almost any moment, as the leaders are too shrewd not to realize that an honorable surrender would be preferable to a crushing defeat, but the fog is too thick to permit of anything like confident assertions, so that the wisest course will probably be to defer comment until there is something definite to talk about and for the present simply say that plenty of iron could be sold at about the following prices for Philadelphia and nearby deliveries:

No. 1 X Foundry.....	\$19.00 to \$19.25
No. 2 X Foundry.....	18.25 to 18.50
No. 2 Plain.....	17.50 to 18.00
Standard Gray Forge.....	16.50 to 17.00
Basic, nominal at.....	17.75 to 18.00
Low Phosphorus.....	24.00 to 25.00
Bessemer.....	19.75 to 20.25
Malleable Iron.....	19.00 to 19.25

Steel Alloys.—It is as hard as ever to get definite information in regard to prices, which vary according to circumstances. Ferromanganese is said to be firmer for the last half of the year, and is also a little stronger for the second quarter, but sellers could be found at about \$85 for the former, and about \$110 for the latter.

Steel.—The demand for Steel is very strong, and business is being done in large lots at the full figures recently quoted—namely, \$29 to \$29.50 for ordinary qualities and \$32.50 to \$35 for Forging Steel.

Plates.—The demand shows no abatement, and leading mills are running to their fullest capacity. There is not only a considerable amount of new business coming in, but specifications were never more prompt than they are at the present time. Of course there is a possibility of the strike interfering somewhat, but apart from that the outlook is excellent. Prices are unchanged as last quoted:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.73½	1.78½
Flange or Boiler Steel.....	1.83½	1.88½
Marine, A. B. M. A. and Commercial		
Fire Box Steel.....	1.93½	1.98½
Marine.....	2.13½	2.18½
Locomotive Fire Box Steel.....	2.23½	2.28½
The above are base prices for ¼-inch and heavier. The following extras apply:		
3-16-inch thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 inches.....		.05
Plates over 110 to 115 inches.....		.10
Plates over 115 to 120 inches.....		.15
Plates over 120 to 125 inches.....		.25
Plates over 125 to 130 inches.....		.50
Plates over 130 inches.....		1.00

Structural Material.—Business is very good, with no impairment as regards the general outlook. Deliveries are slightly better, but on heavy tonnages two to four months is required on many sizes. Beams, Channels and Angles are still quoted at 1.83½c. to 2c., delivered.

Bars.—There is plenty of demand for Merchant Bars, at a price which, however, is below what makers of first-class Refined Bars are inclined to accept. Specifications on old orders are coming in very satisfactorily, however, so that mills are in most cases making full time. Steel Bars are also in good demand, but deliveries are very slow on some sizes, and while 1.63½c. is the nominal price, a little more must be paid to secure quick shipments. Best Refined Bar Iron is quoted at 1.73½c., but it is claimed that less money has been taken for specially desirable business.

Sheets.—The demand is good, at unchanged prices, namely: Nos. 18 to 20, 240c.; Nos. 22 to 24, 250c.; Nos. 25 and 26, 260c.; No. 27, 270c., and No. 28, 280c.

Old Material.—The market shows increasing strength and prices when changed at all have been for the better. Steel Scrap has sold at \$17, which is now the asking price, with \$16.75 bid. Buyers seem inclined to take hold freely, notwithstanding the unsettling influences of the strike. Today's bids and offers for deliveries in buyers' yards are about as follows:

Scrap Steel Rails and Crops.....	\$17.00 to \$17.25
No. 1 Steel Scrap.....	16.75 to 17.00
Low Phosphorus Scrap.....	21.00 to 22.00
Old Steel Axles.....	20.00 to 20.50
Old Iron Axles.....	25.50 to 26.50
Old Iron Rails.....	21.50 to 22.00
Old Car Wheels.....	16.75 to 17.00
Choice Scrap, R. B. No. 1 Wrought.....	19.50 to 20.50
No. 1 Yard Scrap.....	17.50 to 18.00
Long and Short.....	16.50 to 17.00
Machinery Scrap.....	15.50 to 16.00
Wrought Iron Pipe.....	14.50 to 15.00
No. 1 Forge Fire Scrap.....	15.00 to 15.50
No. 2 Light Ordinary.....	10.75 to 11.25
Wrought Turnings.....	13.75 to 14.25
Axle Turnings, Choice Heavy.....	14.50 to 15.00
Cast Borings.....	10.25 to 10.50
Stove Plates.....	12.50 to 13.00
Grate Bars.....	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., April 2, 1906.

Pig Iron.—A gradual improvement is noted in the Iron market, and judging from the number of inquiries the long predicted buying movement is no doubt close at hand. One operator reports more inquiries in the past week than during the two preceding months, and these, too, are for considerable quantities. No sales for large tonnage have been reported, but should only a small percentage of the inquiries result in business it would mean the booking of a good tonnage. Just what prices are being made is rather difficult to determine, but most of the furnaces in the district seem to be getting together on a \$14 No. 2 Foundry basis, although at least two of the largest are still holding for \$14.50. Shipments are keeping up with production, and especially is this true of No. 2 Foundry, this grade being loaded directly from cast houses into cars. Lower grades of Foundry are more plentiful, many of the furnaces still working badly, which has a tendency to force concessions in price. Much pressure is being brought to bear upon the railroads in an effort to have the recent advance of 25c. per ton on Pig Iron and Cast Iron Pipe rescinded. It is argued by the producers that this advance was very inopportune, inasmuch as the market was not sufficiently stable to warrant an advance in freight and that it is working a hardship on them. While some of the railroads seem inclined to meet the views of the furnace-

men, others are very persistent in their demands for a part of the present prosperity, and it is very probable that no action will be taken in the immediate future. Much speculation as to what effect the Coal strike will have on Southern furnaces is being indulged in and most are agreed that should the West Virginia miners continue at work, thus supplying the foundries with Coke, there will be a much greater demand for Southern Iron. However, should the Foundry Coke supply be cut off nothing would remain but for the furnaces to stock their output.

The furnace of the Southern Steel Company at Gadsden is to be blown out for relining within the next few days. This will not, however, affect the company's Steel mill, as arrangements have been made to secure Basic Iron from other furnaces in the district.

Old Material.—A slight improvement has been noted this week, and while no material change is made in prices a better feeling seems to prevail. Steel Scrap has been the best seller, although the demand for Cast has been quite good. Dealers have ample stocks and are quoting approximately the following prices per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$17.50 to \$18.00
Old Iron Axles.....	18.00 to 18.50
Old Steel Axles.....	16.00 to 17.00
Old Car Wheels.....	16.00 to 16.50
No. 1 Railroad Wrought.....	15.00 to 15.50
No. 2 Railroad Wrought.....	14.50 to 15.00
No. 1 Country Wrought.....	13.50 to 14.00
No. 2 Country Wrought.....	11.50 to 12.00
Wrought Pipes and Flues.....	11.50 to 12.00
Railroad Malleable.....	11.50 to 12.00
Mixed Steel.....	9.50 to 10.00
No. 1 Machinery Cast.....	10.75 to 11.25
Stove Plates and Light Cast.....	8.75 to 9.00

At a meeting of the directors of the Tennessee Coal, Iron & Railroad Company held here March 29 no action was taken in the matter of extensions or new improvements, but it was determined to remodel thoroughly the Steel plant and blast furnaces so as to bring them up to the highest state of efficiency. This work will necessarily involve the expenditure of large sums of money and will materially increase the output of the company in its various finishing departments. General improvements will be made in the Coal mining department by additional equipment necessary to secure a greater output in Coal and Coke, as well as to improve the quality.

Pittsburgh.

PARK BUILDING, April 4, 1906.—(By Telegraph.)

Pig Iron.—The Westinghouse Electric & Mfg. Company is expected to close to-day for the purchase of 5000 tons of Foundry Iron for its Allegheny Works and 7000 tons for its Cleveland Works. It is understood that some relatively low prices have gone in on this Iron, especially for the Cleveland plant. Prices on Foundry Iron have weakened to some extent in the past week and Northern brands of No. 2 are only fairly strong at \$16.50, Valley Furnace, and it is probable that on any desirable tonnage some sellers would shade this price. It is said that the Steel Corporation will need upward of 50,000 tons of Bessemer Iron for second quarter delivery. The corporation will likely buy this week from the Bessemer Pig Iron Association 10,000 to 12,000 tons for April delivery at \$17.25, Valley furnace. A local Steel casting concern is in the market for 500 tons of Bessemer Iron, deliveries commencing this month. We quote Standard Bessemer at \$17.25, Valley furnace, for large lots and \$17.35 to \$17.50 for small lots. Forge Iron is lower and Valley makes are offered at \$15.75 at furnace or \$16.60, Pittsburgh.

Steel.—There is a little more inquiry for Steel, and both Bessemer and Open Hearth Billets and Bars are very scarce, especially the latter. We quote Bessemer Billets at \$27, and Open Hearth at \$28, Pittsburgh. We quote Bessemer and Open Hearth Sheet and Tin Bars in random lengths at \$28, Pittsburgh, plus freight to point of delivery, while for Cut Bars an extra of 50c. a ton is charged. Forging Billets are held at about \$32, Pittsburgh.

Steel Rails.—The Carnegie Steel Company has advanced prices on Light Rails, 25 to 45 lb. section, \$1 a ton, and is now holding these at \$28 in large lots and \$29 for small lots.

(By Mail.)

As far as the Pittsburgh district is concerned there will be no Coal strike. The Pittsburgh Coal Company, which has an annual capacity for mining over 10,000,000 tons, and independent operators with an annual capacity of about the same tonnage have signed the miners' scale, giving their miners an advance of 5.5 per cent. in wages, effective from April 1. While it is true that a large number of independent operators in the district have refused to sign the scale and closed down their mines, yet it is hardly likely that these mines will be idle very long. We note a distinctly better inquiry for Pig Iron, and while there is some unevenness in the prices of Foundry Iron the general market is quite firm,

especially on Basic and Bessemer Iron. The Westinghouse Electric & Mfg. Company is in the market for 12,000 tons of Foundry Iron for second and third quarter delivery—4000 tons for its Walker works at Cleveland, Ohio, and 8000 tons for its Allegheny and East Pittsburgh works. The bids are all in on this Iron and it is expected to be placed on Wednesday or Thursday of this week. It is quite likely that relatively low prices will be made on the Cleveland Iron, and it is not unlikely that \$17, Valley furnace, will be shaded slightly on the Allegheny and East Pittsburgh Iron. It is also probable that a part of this tonnage will be Southern Iron to be used as softeners. The placing of this tonnage will give a pretty good line on the actual condition of the Foundry Iron market, as it is the largest inquiry that has been in the market for some time. It is likely that before this week is out the Steel Corporation will buy from 10,000 to 12,000 tons of Bessemer Iron from the Bessemer Pig Iron Association for April delivery at \$17.25, Valley furnace. Negotiations are on for the purchase of this Iron and it will be put through before this week is out. Bessemer and Basic Iron are quite strong, Bessemer being held at \$17.25 to \$17.50 and Basic \$17, Valley furnace. Northern brands of No. 2 are held at about \$17, Valley furnace, but on some recent sales this price has been shaded about 50c. a ton or more. Northern Forge Iron is slightly weaker and we quote it at \$15.85 to \$16, Valley furnace. The Steel situation is quiet as far as new business is concerned, but consumers of Billets, Sheet and Tin Bars who have contracts with the Carnegie Steel Company are paying \$2 more for their Steel, effective from April 1. Bessemer Billets are quoted from \$27 to \$28 and Open Hearth from \$28 to \$29 for prompt delivery, while Sheet and Tin Bars in random lengths are \$28 and \$29, maker's mill. The fact that there will be no general Coal strike in the Pittsburgh district is expected to have the effect of softening prices on Coke, which have been firm and higher for some time owing to the fear of a strike. The Scrap market continues dull and neglected and prices are weak. In Finished Iron and Steel there is nothing of particular interest to note, new business in Rails and Structural Steel continuing enormously heavy, but on other lines, such as Plates, Iron and Steel Bars, Sheets, Tin Plate and Pipe, being only fair. New tonnage in Wire products is light, but the mills are very busy on contracts and shipments are heavy.

Ferromanganese.—It is practically impossible to quote Ferro for spot shipment, the price depending altogether on how badly the buyer needs the material. It is likely that 80 per cent. foreign Ferro for spot delivery could be bought at about \$130 to \$135, while for May and June delivery from \$100 to \$105 is asked. There is no inquiry in the market for Ferro for the last half of the year, but the price is \$85 to \$90 for this delivery.

Muck Bar.—In the entire absence of sales we quote best grades of Muck Bar, made from all Pig Iron, at \$28, Pittsburgh. Possibly on a firm offer this price might be shaded, as the market is weak.

Steel Rails.—Orders for Rails continue to flow into the mills. Upward of 75,000 tons have been placed since our last report and other large orders are pending. The Rail mills are now having trouble in arranging satisfactory deliveries, most of the roads wanting early shipments, but some of them will have to wait, as the mills are so badly crowded with tonnage. There is a good demand for Light Rails, prices being firm as follows: 8-lb., \$36; 10-lb., \$32; 12-lb., \$30; 16-lb., \$29; 20-lb., \$28.50; 25 to 45 lb., \$27.50 to \$28, maker's mill.

Rods.—The market is very firm, with the two leading producers of Rods still out of the market as sellers. We quote Bessemer and Open Hearth Rods at \$34, and Chain Rods at \$35, Pittsburgh.

Skelp.—Buyers are specifying on contracts, and shipments by the mills that roll Skelp are fairly heavy. Prices are as follows: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Machinery.—No large contracts from this district have been placed in the past week, but a good deal of local work is in sight. The First National Bank will start work about June 1 on a large office structure, to be located at Fifth avenue and Wood street, which will take upward of 10,000 tons. Bids are expected to be ready in a short time. All the leading Structural concerns are filled up with work for all of this year, and the American Bridge Company is sold up into next year. The new Structural mill of the Jones & Laughlin Steel Company is finished and may start this week. It will have a monthly capacity of about 8000 tons of the medium sizes of Beams and Channels. It is a most modern mill, and was erected in remarkably short time, the first actual work having been done on the mill late in November last year. Prices are very firm, and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.75c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the

Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—Some of the Plate mills are not actively seeking new tonnage as they are short of Steel and cannot get a full supply. New tonnage in Plates is not as heavy by any means as it was some time ago, but specifications, especially from the Steel car works, are coming forward very freely and shipments are heavy. The market is firm, official prices being maintained except on the narrow sizes on which some of the outside mills occasionally shade about \$1 a ton. We quote Tank Plates, ¼-inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Roller and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—Jobbers who have large stocks of Sheets are now speculating on these and are offering them in some cases as much as \$2 a ton below mill prices. The consumption of Sheets continues enormously heavy, and the mills are shipping their output as fast as made. The American Sheet & Tin Plate Company is said to be sold up on Sheets to July 1, and cannot make deliveries inside of 60 to 90 days. Prices are only fairly firm, and we quote: Black Sheets, Box Annealed, one pass through cold rolls, Nos. 10 to 12 gauge, 1.95c. to 2c.; Nos. 13 and 14, 2c. to 2.05c.; Nos. 15 and 16, 2.05c. to 2.10c.; Nos. 17 to 21, 2.10c. to 2.15c.; Nos. 22 to 24, 2.15c. to 2.20c.; Nos. 25 and 26, 2.20c. to 2.25c.; No. 27, 2.25c. to 2.30c.; No. 28, 2.35c. to 2.40c.; No. 29, 2.50c. to 2.55c., and No. 30, 2.60c. to 2.65c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.30c. to 2.35c.; Nos. 12 to 14, 2.40c. to 2.45c.; Nos. 15 and 16, 2.50c. to 2.55c.; Nos. 17 to 21, 2.65c. to 2.70c.; Nos. 22 to 24, 2.80c. to 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.20c. to 3.25c.; No. 28, 3.40c. to 3.45c.; No. 29, 3.65c. to 3.70c., and No. 30, 3.90c. to 3.95c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.60 to \$1.65 per square, and Galvanized Roofing Sheets, No. 28 gauge, at \$2.95 to \$3 per square for 2½-inch corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Bars.—At the meeting of the Steel Bar mills, held at the Duquesne Club, this city, on Wednesday afternoon, March 28, the situation in Bars was thoroughly gone over and it was decided to make no change in prices. The large implement makers who are ready to place their season contracts have been importuning the mills for some time to make a reduction in prices on the large tonnage they are prepared to contract for, but in view of the very high price and scarcity of Steel, the makers decided that lower prices in Steel Bars were not warranted. Whether the implement makers will refuse to place their contracts remains to be seen, but it is probable they will hold off for a time at least. New tonnage being placed in both Iron and Steel Bars is only fair, but the mills are still busy on contracts, on which buyers are specifying freely, the mills still being somewhat behind on deliveries. We quote Refined Iron Bars at 1.60c. to 1.65c., Pittsburgh, and Steel Bars at 1.50c., base, half extras, for carloads and larger lots.

Hoops and Bands.—No new business of any moment is being received by the mills, consumers being covered by contracts placed when prices were lower than they are now and on which buyers are specifying freely. We quote Steel Hoops at 1.90c., and Bands for all purposes at 1.50c., base, half extras as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Tin Plate.—The mills are busy on old contracts for Tin Plate placed by consumers when prices were \$3.25 and \$3.35 per box, and on which they are specifying liberally. Very little new business is being placed and the buying season will not start for some time yet. We quote Tin Plate at \$3.50 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in ten days, on

which price a rebate of 5c. a box is allowed for carloads and larger lots.

Merchant Steel.—Not much new business is being placed and in view of the refusal of the mills to reduce prices on Steel Bars it is likely the large implement makers will hold off placing their season contracts in order to thoroughly test the market. Prices are fairly strong, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to $1\frac{1}{2}$ x $\frac{1}{2}$ inch, 1.65c., and Iron Finish, $1\frac{1}{2}$ x $\frac{1}{2}$ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: $\frac{3}{4}$, $\frac{1}{2}$ and 1 inch, 2c., and $1\frac{1}{2}$ -inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—We note a fair demand and prices are firm. We quote \$2 and \$2.05 per 100 lbs., f.o.b. Pittsburgh.

Spelter.—The demand has again quieted down and prices are easier. We quote prime grades of Western Spelter at 6c., St. Louis, equal to 6.12 $\frac{1}{2}$ c., Pittsburgh.

Merchant Pipe.—There is a seasonable demand for Merchant sizes, but nothing doing in oil country goods. There is no change in prices, the extreme discount on Merchant sizes of Steel Pipe remaining at 81 per cent. off to the large trade. Official discounts, which are shaded about one point to the large trade, are as follows:

	Merchant Pipe.			
	Jobbers, carloads.		Iron.	
	Black.	Galv.	Black.	Galv.
$\frac{3}{4}$ and $\frac{1}{2}$ inch.....	72	58	69	53
$\frac{1}{2}$ inch.....	74	60	71	57
$\frac{1}{2}$ inch.....	76	64	73	61
$\frac{3}{4}$ to 6 inches.....	80	70	77 $\frac{1}{2}$	67 $\frac{1}{2}$
7 to 12 inches.....	75	60	72 $\frac{1}{2}$	57
Extra strong, plain ends:				
$\frac{3}{4}$ to $\frac{1}{2}$ inch.....	65	53	62	50
$\frac{1}{2}$ to 4 inches.....	72	60	69	57
$\frac{3}{4}$ to 8 inches.....	68	56	65	53
Double extra strong, plain ends:				
$\frac{3}{4}$ to 8 inches.....	61	50	58	47

Boiler Tubes.—Locomotive Tubes are in heavy demand and the mills are behind in deliveries, but there is very little doing in Merchant Tubes. Discounts are as follows:

	Boiler Tubes.	
	Iron.	Steel.
1 to $1\frac{1}{2}$ inches.....	41	46
$1\frac{1}{2}$ to $2\frac{1}{4}$ inches.....	41	58
$2\frac{1}{4}$ inches.....	46	60
$2\frac{3}{4}$ to 5 inches.....	53	66
6 to 13 inches.....	41	58

Iron and Steel Scrap.—The Scrap market continues quiet, no large consumers being in the market, while prices are weak. There is more or less Scrap pressing the market to find buyers, with the result that prices are very often shaded to effect sales. Dealers quote about as follows: Heavy Melting Scrap, \$14.50 to \$14.75; Bundled Sheet Scrap, \$13.50 to \$13.75; Old Steel Rails, short pieces, are \$14.50 to \$14.75; long pieces, for rerolling, \$15.75 to \$16; Cast Iron Borings are weak at \$9; Machinery Cast Scrap, \$15.25 to \$15.50; Old Car Wheels, \$17.75 to \$18. All the above prices are for gross tons, f.o.b. Pittsburgh.

Coke.—The fact that there will be no general Coal strike in the Pittsburgh district is expected to have the effect of weakening prices on both Furnace and Foundry Coke, which have been very firm for some time. We quote best grades of strictly Connellsville Furnace Coke \$2.30 to \$2.40 per ton, and 72-hour Foundry Coke at \$2.90 to \$3 per ton. There are very large stocks of Coke piled up in the Connellsville region and there is no trouble to get prompt delivery. The Upper and Lower Connellsville regions made about 381,000 tons last week.

Cincinnati

FIFTH AND MAIN STS., April 4, 1906.—(By Telegraph.)

Pig Iron.—The past week has developed a little better feeling and the general situation is possibly a shade stronger than it was a week since. This is not so noticeable in the way of better prices, as they are practically unchanged, but that a change for the better is coming is evidenced by the fact that several of the larger consumers are now in the market. Before long others will follow and the buying movement become general. It looks as though the strike of the miners, especially in the Bituminous region, would be of insignificant proportions as several of the larger operators have adjusted matters in a satisfactory manner, and there are excellent prospects that before the end of the week this number will be considerably augmented. This may have had some bearing on market conditions. There is one feature of the situation that is very gladly welcomed, and that is the fact that there has been a continuous growth in the way of small inquiry. This has assumed rather fair proportions within the past week. Just what will be the result of the

closing of contracts for 12,000 to 15,000 tons now being contemplated by one of the large machinery builders of the country is mere conjecture, but it is possible that some low prices may develop which would make an entire change in selling prices. Freight rates from Hanging Rock district to Cincinnati are \$1.15 and from Birmingham \$3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$17.00 to \$17.50
Southern Coke, No. 2.....	16.50 to 17.00
Southern Coke, No. 3.....	16.00 to 16.50
Southern Coke, No. 4.....	15.25 to 15.75
Southern Coke, No. 1 Soft.....	17.00 to 17.50
Southern Coke, No. 2 Soft.....	16.50 to 17.00
Southern Coke, Gray Forge.....	14.75 to 15.25
Southern Coke, Mottled.....	14.50 to 15.00
Ohio Silvery, No. 1 (8 per cent. Silicon).....	21.65 to 22.15
Lake Superior Coke, No. 1.....	18.15 to 18.65
Lake Superior Coke, No. 2.....	17.65 to 18.15
Lake Superior Coke, No. 3.....	17.15 to 17.65

Car Wheel Irons.

Standard Southern Car Wheel.....	\$23.50 to \$24.00
Lake Superior Car Wheel.....	22.00 to 22.50

Coke.—The market is said to be fairly active with prices strong. It is presumably true that a large number of contracts were placed and shipped before being urgently required owing to expected labor troubles. We quote the best brands of Connellsville and Virginia Foundry from \$3 to \$3.25, f.o.b. ovens.

Finished Iron and Steel.—The demand along all Structural lines continues to show great strength. Several of the larger concerns are sold ahead into the fall months and are unable to make deliveries on new contracts prior to that period. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.75c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, $\frac{1}{4}$ -inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x $\frac{1}{4}$ inch or heavier, 1.83c., in carload lots.

Old Material.—Trade in Scrap is showing more activity and a brighter feeling prevails. Dealers are handling quite a large tonnage and making quick turns. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$15 to \$15.50 per net ton; Cast Borings, \$8.50 to \$9 per net ton; No. 1 Cast Scrap, \$12 to \$13 per net ton; Iron Rails, \$22 to \$22.50 per gross ton; Steel Rails, rolling mill lengths, \$15 to \$16 per gross ton; Relaying Rails, 56 lbs. and upward, \$28 to \$29 per gross ton; Iron Axles, \$24 to \$24.50 per net ton; Car Wheels, \$18.50 to \$19.50 per gross ton; Low Phosphorus Scrap, \$18 to \$19 per gross ton.

The Quinn Furnace Company, whose furnace at Gadsden, Ala., is being completely rebuilt, is expected to blow in within the next two weeks. This furnace will produce about 50 tons of Charcoal Car Wheel Iron per day and will be represented by the Robert Field Sales Agency, whose offices now occupy a spacious suite of rooms on the fifteenth floor of the First National Bank Building, Cincinnati.

Cleveland

CLEVELAND, OHIO, April 3, 1906.

Iron Ore.—It now seems impossible that the lake season of navigation shall open before May 1, and boats may not start even then. The labor situation is complicated. One part of the lake pilots are affiliated with the lake seamen and another part with the longshoremen. Those affiliated with the seamen have come to terms with the Lake Carriers' Association. The longshoremen have announced that they will not seek another conference with the Lake Carriers' Association or the dock managers, but that if peace is desired the initiative must come from the other side. The question on which the last conference went to pieces was that of recognition of the union of lake pilots affiliated with the longshoremen. Any call for a conference on the part of either the dock managers or the Lake Carriers' Association would imply consent to recognize the pilots through the longshoremen. This promises an indefinite prolongation of the conflict. Another labor meeting is called, however, for April 18 at Erie, Pa., which has a different complexion. It is between the seamen and the longshoremen, to determine the jurisdiction of the various organizations. The question at issue is whether the pilots have any right to affiliate with the longshoremen, since their natural affiliation is with the seamen. The question of discipline on board the boats, with the seamen and the pilots in the same fraternal organization, has been the determining influence heretofore. Attempts are to be made to inject another issue and deprive the longshoremen of their latest affiliated body. Any such action as this would automatically adjust the lake difficulty, since the pilots affiliated with the seamen have already come to terms with the Lake Carriers' Association and their union has been recognized. The delays incident to the coming conference are sure to keep boats tied to the docks until May 1, even if other conditions are favorable to the opening of navigation.

In the meantime the lake trade is at a standstill and whereas wild rates are usually fixed by this time the question of carrying charges is not being discussed in either boat or shipping circles.

Pig Iron.—After a month of rather extreme dullness the market in Foundry Pig Iron is beginning to strengthen. It is considered that a good buying movement has started this early for Iron, for delivery through the last half of the year. New inquiries are coming in from all sides, some of which are considered simply market feelers. One of these is for 12,000 tons by a large electrical interest, which will use half in its Cleveland plant and half in Pittsburgh. The business will be closed this week. Another order runs up to 5000 tons, with a good many on a smaller scale. On this future business it is said that prices are not being shaded, and the general market is steady at \$17 in the Valleys for No. 2, although sales have been made as low as \$16.75. Spot buying is also heavy, and the foundries are taking up all that can be produced. Reports from furnaces in this territory are that less Iron is in stock in some of the yards than at any time since the furnaces were built. The scarcity of stock is especially marked in the case of one Cleveland furnace. Foundrymen are asking furnaces to anticipate shipments. One consumer came into the market on Monday and asked that his whole April quota be shipped at once. In the Bessemer and Basic markets there is a strong demand for spot material, although buying for the future has not started as yet. Some few Southern furnaces are offering No. 2 Foundry in this territory on the basis of \$14, Birmingham. For the first time in years Furnace and Foundry Coke have been on the same level in the past week. In view of the coal strike buyers have been anxious to cover their needs, some of them not having laid in a supply. Both 72-hour Foundry and Furnace Coke are selling at \$3.15 to \$3.25 at the oven.

Finished Iron and Steel.—There is hardly a perceptible change in many lines of Finished Material. The Billet market has been stronger, Bar Iron is weaker and there is gradually increasing strength in Sheets. The Billet supply is being shortened and salesmen are hard put to it to take care of the demand. In Forging Billets one sale was made at \$35 at the mill, which brought the price delivered close to \$38 a ton. There is a good demand for Bessemer Re-rolling Billets, but the supply seems to be practically exhausted. The quotation on Bessemer 4 x 4 Billets has gone as high as \$30 at the mill. Sheets are stronger, with a good steady demand. Jobbers' trade is showing a marked improvement. Prices out of stock hold as they have been at 2.15c. for No. 10 Black, 2.70c. for No. 28 One Pass Cold Rolled and 3.70c. for No. 28 Galvanized. Owing to a decline in the Scrap market Bar Iron is easier, the price being influenced also by light buying and the heavy production. The market is now between 1.65c. and 1.70c., Youngstown. Other Finished Materials are about as they have been, with buying for immediate needs mostly in evidence.

Old Material.—The market has continued to show weakness, and while prices have not broken, are yielding. The following are dealers' prices to the trade, f.o.b. Cleveland, gross tons: Old Steel Rails, \$14.50 to \$15.50; Old Iron Rails (nominal), \$22 to \$23; Iron Car Axles, \$17.50 to \$18.50; Heavy Melting Steel, \$14 to \$15. Net tons: Cast Borings, \$8.50 to \$9; No. 1 Busheling, \$12.50 to \$13.50; No. 1 Railroad Wrought, \$15 to \$16; No. 1 Cast, \$13.50 to \$14.50; Stove Plate, \$11; Iron and Steel Turnings and Drillings, \$10 to \$11.

German Iron Market.

BERLIN, March 22, 1906.

During the past two weeks the situation in the Iron industry has continued to engage the closest attention of financial and industrial circles. The question whether the top wave of the boom has been reached has been discussed from all sides. Opinions remain divided as to the answer to be given to it, inasmuch as the facts throwing light upon it do not afford an emphatic answer one way or the other. The price movement, which is really the key to the situation, is not uniform. The cut of 4 marks on Luxemburg Foundry Iron, mentioned in my last letter, has been followed this week by a further cut of 2 marks. It is pointed out, however, that this cut has not been made by the manufacturers, but only by dealers at points where English Iron competes with German. Another fact that looks like a change in the situation is that Old Iron and Scrap are being offered in large amounts and can only be sold at a reduction of 2 or 3 marks. Still another indication of a change in the situation is the slowing up of the foreign demand for German Iron and Steel. The Berlin stock market has this week shown a marked weakness for Iron shares upon a report from the Upper Silesian Steel Verband which says that the foreign demand has become materially lighter.

On the other hand, the manufacturers of machinery and structural castings in the lower Rhine country and in the Province of Hessen-Nassau last week increased their prices by 1 mark per metric hundredweight. This news was made

much of on the Bourse and assisted in inaugurating a sharp upward spurt in Iron shares. The optimists have further reasons to assign for their faith in the boom's life expectancy. The cut on Luxemburg Foundry, they say, has not great significance, since the Lorraine-Luxemburg Syndicate cannot begin to supply the momentary needs of the home market; also that the Düsseldorf Syndicate, which is the principal Crude Iron organization of the country, is itself under the necessity of ordering extra supplies in England. Only this week it has asked some of its customers to release it from the obligation to fill contracts and advised them to buy English Iron instead. The optimists also call attention to the fact that the English stocks, which had swollen a month ago to serious dimensions, have latterly been considerably reduced, and the price of warrants has improved since the first serious break.

The Steel Syndicate Takes a Cheerful View.

The great Steel Verband still maintains a cheerful view of the situation. Several days ago the management of the Verband answered a newspaper inquiry on this subject in the following terms: "The amount of orders on hand, both with us and with competing foreign works, shows no weakening in the situation. The pressure to buy was extraordinarily strong up to a very recent date, which may be attributed to the fact that further considerable advances in prices were expected. Since we decided, notwithstanding the price advances in raw materials and the scarcity of Manganese Ores, to adhere to the moderate prices fixed several months ago, consumers have become reassured. The fact must not, however, be ignored that the long continued political uncertainty and the high level of money rates have tended to check new enterprises, and this is the reason why we have not made an increase of allotments, although the volume of orders on hand would have fully justified such a step. Just as we have tried to prevent heavy price advances, we shall endeavor to keep prices from going down."

Although the Verband here gives reasons for not increasing allotments, it is still expected that this will have to be done. A meeting of the great combination is called for next week, when this question will come up for discussion. It is known that many companies favor an increase, in view of the enormous volume of orders for railroad materials and structural forms. It is said also in well informed quarters that the Verband expects the market situation to improve. This is looked upon as practically certain if the Algeciras conference soon reaches a satisfactory solution of the vexed Morocco question, which has so long checked confidence and crippled enterprise in German financial and industrial quarters.

The Silesian report referred to above also takes a cheerful view of the home market's prospects. "The domestic situation," it says, "is thoroughly sound and gives no occasion whatever for concern about the future. The stocks of dealers are certainly not over large; neither has any backset in the brisk activity of machine shops, bridge building and similar construction establishments and car building concerns been reported."

The Situation Not Clear.

From all the above it appears that the situation is by no means clear, but with good grounds for continued confidence, so far as the home market is concerned. The worst that can be said about the latter is that a quieter tone is observable in some lines of the trade. Consumers of certain forms of rolled goods are, to a certain extent, disposed to wait and watch the developments of the next month or two before making new orders. However, the calls for delivery of goods already ordered are very heavy and must in many cases be repeated before shipment follows. The demand for Pig Iron remains beyond the capacity of the furnaces to supply, and the Düsseldorf Syndicate states that the demand is increasing. The shipments of the Steel Verband in February have not yet been published, but it is understood that the movement was at about the same rate as in January. Despite the slowing up in orders for some forms of rolled goods the momentary demand in other lines cannot be adequately supplied. In Rolled Wire stock, for example, scarcity prevails. Notwithstanding the exception just noted, it is asserted that the consumptive capacity of the home market is still growing. From the electrical industry, in particular, there is a steadily increasing demand for Iron supplies.

The Kraft Works, the independent blast furnace company situated near Stettin mentioned in my last letter, has declared a dividend of 11 per cent. for 1905, as compared with 8 per cent. for 1904. This concern is now acting in harmony with the Düsseldorf Pig Iron Syndicate, but it says in its annual report that its prices for 1905 contracts were fixed before it made its arrangement with the latter and adds that "this contradicts the erroneous view that it can only do a profitable business by acting in harmony with the syndicate."

The project for a furnace plant at Emden, the North Sea port of the Dortmund-Ems Canal, has now taken definite shape. The capital of \$750,000 is assured and the Govern-

ment offers a favorable site near the terminus of the canal. This and the other furnaces on the coast mentioned in my last letter expect to reap a considerable advantage from the fact that they will have the option of choosing between English and German Coke, besides being able to choose between the foreign and home market for the sale of their product.

Iron Ore and Coal.

The Ore situation remains very strong. Home mines are still unable to supply what is called for; they are refraining from quoting prices beyond the end of June and it is not by any means certain that they will continue to take orders at present prices. Swedish Ores are scarce and dear. Manganese Ores have again been coming in from the Caucasus, but in quite unsatisfactory amounts.

The situation in the Coal market is not wholly satisfactory. About the end of December the Coal Syndicate abolished all restrictions on the output, and by February, the car famine having at last been overcome, the Coal movement was by far the heaviest ever registered. It reached for the Essen region as much as 227,000 tons a day, and the daily average for the month was probably above 220,000 tons. Since the beginning of March, however, shipments range from 10,000 to 20,000 tons lower. The reduction is partly due to a slackening in demand and partly to a renewal in a milder form of the car famine. It is now expected that the syndicate will have to enforce a restriction on allotments after April 1, on which date the higher prices voted in November take effect. The syndicate has also resumed its export business, whereas it announced a month or two ago that it could take no more foreign orders.

New York.

NEW YORK, April 4, 1906.

Pig Iron.—There has been some buying in anticipation of a scarcity which may result from a strike in the Anthracite Coal mines, but the movement is not widespread or pronounced. Some of the furnace companies in the Lehigh and Schuylkill valleys have advanced their asking prices, but we cannot learn that any business has been done at the higher range. We note one sale of 5000 tons of No. 2 Southern Foundry, the largest block of Iron of this character sold in this market for a long time. We note also a sale of 8000 tons of Basic Pig, partly misfit Iron. Some good business has also been done in New England. We quote Northern Iron, No. 1 Foundry, \$18.50 to \$19; No. 2 Foundry, \$18 to \$18.75; No. 2 Plain, \$17.50 to \$18. Southern Iron is quoted at \$18.25 to \$18.50 for No. 1 Foundry, and \$17.50 to \$18 for No. 2 Foundry.

Steel Rails.—Among orders placed in the past week are the following: Denver, Kansas & Gulf, 5700 tons; Youngstown & Ohio, 3000 tons; Monongahela Connecting Railway, 1000 tons; Fredericksburg & Potomac, 4300 tons; Tonopah & Goldfield Railway, 8000 tons, making a total of 14,000 tons for that line; Brookville & Mahoning Valley, 5000 tons; Washington, Baltimore & Annapolis, 3100 tons. The total is 35,000 to 40,000 tons. To-day the problem is to adjust operations so that the railroads can get the deliveries desired. It is evident that this will not be possible in all cases.

Structural Steel.—No diminution appears in the amount of new work coming on the books of fabricating companies. The partial settlement of the Coal mining differences has made the situation clearer in respect to new work, but there is still more attention given by certain consumers to getting deliveries on existing contracts than to the placing of new ones. The American Bridge Company did the largest business it has booked in any March, a total of over 60,000 tons, making it the best month of this year. A feature of this tonnage was its wide distribution and the fact that no single contract was of conspicuous size. Outside companies have been getting more than a majority of recent business and in New York City independent interests have been awarded three-fourths of the contracts placed since the first of the year. It is evident that bridge companies will have their capacity occupied this year to the last ton. New manufacturing plants and extensions in industrial lines are no small factor. Transmission equipment lines are feeling this also. One recent contract was for 1500 tons for a new plant of the American Sheet & Tin Plate Company. The American Bridge Company also booked a 1400-ton order the past week for new shops in Tennessee for the Southern Railway. Four railroads—the Big Four, the Lehigh Valley, the Queen & Crescent and the Pittsburgh & Lake Erie—are figuring on bridges requiring a total of 25,000 tons. We quote mill shipments, f.o.b. New York, as follows: Beams, Channels, Angles and Zees, 1.84½¢; Tees, 1.89½¢; Bulb Angles and Deck Beams, 1.99½¢. Beams, 18 to 24 inch, 0.10¢ extra; angles, over 6 inches, 0.10¢ extra.

Bars.—A considerably better feeling is reported in Bar Iron. This is partly due to a broader inquiry, some little increase in sales and the very decided improvement in the demand for Bolts, Nuts and other products made from Bar Iron. Both Bar Iron and Steel Bars are quoted at 1.64½¢.

to 1.74½¢., tidewater, according to specifications, time of delivery, &c.

Plates.—The Eastern mills are still well supplied with work and prices are firm, but very little new business is being sent in from this locality so far as Sheared Plates are concerned. The demand for Universal Plates is better. Quotations are continued, as follows, at tidewater: Sheared Tank Plates, 1.74½¢. to 1.84½¢.; Flange Plates, 1.84½¢. to 1.94½¢.; Marine Plates, 2.14½¢. to 2.24½¢.; Fire Box Plates, 2.24½¢. to 2.60¢., according to specifications.

Cast Iron Pipe.—The Department of Water Supply, New York, has postponed until April 11 the opening of bids for 24,000 tons of principally 48-inch Pipe and 1200 tons of Specials. Eastern manufacturers report a heavy influx of orders from all classes of consumers and no stock on hand from which to make prompt shipments. Prices are firm at \$30.50 per net ton for carload lots of 6-inch, at tidewater.

Old Material.—Dealers report a greatly improved demand for practically every kind of Scrap. Cast Borings are in particularly strong demand as well as Wrought Pipe. Wrought Scrap is moving only moderately, as the rolling mill owners are as yet making up their minds very slowly about covering their requirements. Steel Scrap is strong, with sales of 2500 to 3000 ton lots. Cast Scrap, Stove Plate and Old Car Wheels are moving well. Plenty of inquiries are in the market, and holders of Scrap are quite generally selling instead of waiting for higher prices. Approximate prices per gross ton for New York or vicinity are as follows:

Old Iron Rails.....	\$20.00 to \$21.00
Relaying Rails.....	25.50 to 26.00
Old Steel Rails, rerolling lengths.....	16.50 to 17.50
Old Steel Rails, short pieces.....	15.00 to 16.00
Heavy Melting Steel Scrap.....	15.00 to 16.00
Standard Hammered Iron Car Axles.....	24.50 to 25.50
Old Steel Car Axles.....	20.00 to 21.00
No. 1 Railroad Wrought.....	19.00 to 20.00
Iron Track Scrap.....	16.50 to 17.50
No. 1 Yard Wrought, long.....	17.00 to 18.00
No. 1 Yard Wrought, short.....	15.00 to 15.50
Wrought Pipe.....	13.50 to 14.50
Light Iron.....	10.00 to 10.50
Cast Borings.....	9.00 to 9.50
Wrought Turnings.....	12.50 to 13.50
Old Car Wheels.....	17.50 to 18.00
No. 1 Machinery Cast.....	15.00 to 16.00
Stove Plate.....	11.50 to 12.00
Grate Bars.....	10.00 to 10.50
Malleable Cast.....	16.50 to 17.50

C. W. Leavitt & Co., importers and exporters of Ores, Metals and Alloys, 15 Cortlandt street, New York, will be located in the St. Paul Building, 220 Broadway, New York, after April 21.

Metal Market.

NEW YORK, April 4, 1906.

Pig Tin.—With the market cornered both in London and New York and many buyers making good sized purchases either in fear of still higher prices or because it is an absolute necessity to secure Tin, the market is in an unsettled state. At to-day's closing price of £173 5s. for spot in London that market has advanced £5 since our last report. Futures are held at £169, the discount indicating the corner. This high figure has not been equaled in the last 55 years and perhaps never. The 55-year period is as far as the records of the New York Metal Exchange go. Business was done on a basis of between 37.25¢. and 37.40¢. until Monday of this week, when some more of the pegs were driven home and the market was quickly shoved up to 37.55¢. On the 3d another advance of 20 points carried prices for spot Tin to 37.75¢. To-day's market presents wide fluctuations and business is likely to be done at figures varying from 38.25¢. to 38.37½¢. Future deliveries to arrive within a week or ten days are selling at 25 to 30 points below current quotations. There is a more plentiful stock in the country, but all supplies are firmly held for very high prices. Some well informed in market affairs predict that these high prices will prevail through the greater part of April. The arrivals so far this month aggregate 365 tons; the afloats are 3256 tons. The Tin statistics as compiled by C. Mayer, secretary of the New York Metal Exchange, were very favorable to holders of the metal. The total visible supply for Europe and the United States on March 31, 1906, was 11,848 tons, against 13,414 tons February 28, 1906, and 14,592 tons March 31, 1905. The stocks in the United States, including on dock and landing, amount to 694 tons, which is extremely small, being only about six days' consumption. The consumption in the United States during March was 3850 tons. The total shipments from the Straits to Europe and the United States were 600 tons smaller in March than in February.

Copper.—Business in this country has fallen off to a slight extent, but European consumers have bought more liberally, consequently the market is firmly maintained at 18.62½¢. to 18.75¢. for Lake, 18.37½¢. to 18.62½¢. for Electrolytic and 18.12½¢. to 18.50¢. for Casting Grades. While the movement in this country has not been of sufficient importance to characterize it as good buying, still a

considerable tonnage has been sold for delivery during June and later months. There is very little if any Copper in the hands of the principal sellers for April or May delivery, and future months are being rapidly sold up. This leads men of conservative mind to believe that higher prices will surely be the rule. The European markets are higher and more active. Standard warrants close to-day at £84 15s. for spot, £82 5s. for futures, with Best Select held at £88 10s. It is stated on good authority that production is likely to increase at a more rapid rate than many believe is now possible, even though all freely admit that producers are anxious to make Copper as fast as possible to sell at the present high level. The exports for the first four days of this month aggregate 1954 tons. The total exports of Copper from American ports, exclusive of Southern and Pacific, aggregated 16,013 tons during March. The exports since January 1, 1906, aggregate 47,121 tons, against 59,826 tons during the corresponding period last year.

Pig Lead.—A fair run of business has been transacted during the week, but at prices practically unchanged from those prevailing for the last month. New York quotations for spot Lead are steady at 5.35c. to 5.45c. The American Smelting & Refining Company continues to quote shipment Lead in 50-ton lots at 5.35c. In St. Louis the market is a trifle easier at 5.25c. The London market is unchanged at £15 17s. 6d.

Spelter.—The market is easy and prices are slightly lower at 6.10c. to 6.20c. for spot stocks, New York. In St. Louis the market is also dull and easy at 6c. The total shipment of Ore, since January 1, from the Joplin district has decidedly increased over the corresponding period last year. The London market is unchanged at £25 2s. 6d.

Antimony.—The price continues to advance and for all grades 18c. to 19c. is quoted. There have been some small arrivals of the metal this week, but it is believed that these have gone directly into consumption. A sale of about 400 tons of Japanese Antimony to the Russian Government is supposed to have been responsible for this last sharp advance. While there is a fair stock of metal in this country, it is firmly held for higher prices.

Tin Plate.—The price of Tin Plate is unchanged, although it was believed in some quarters that the advance in the price of Billets by the Carnegie Steel Company would result in higher prices for both Sheets and Tin Plates. The market is firm, however, at \$3.50, f.o.b. Pittsburgh, and \$3.69, f.o.b. New York. New contracts are not coming in very freely, but specifications on old ones are and there is considerable delay in getting shipments from the mills. In Swansea Welsh Plates are 1½d. lower at 12s. 3d.

Old Metals.—There has been a fair buying demand, especially for Copper products. Dealers, however, are not disposed to load up heavily with stocks and are endeavoring to move their accumulation as fast as possible. We quote dealers' buying prices as follows:

	Cents.
Copper, Heavy Cut and Crucible.....	17.75 to 18.00
Copper, Heavy and Wire.....	17.25 to 17.50
Copper, Light and Bottoms.....	15.50 to 16.00
Brass, Heavy.....	11.75 to 12.00
Brass, Light.....	10.00 to 10.25
Heavy Machinery Composition.....	15.50 to 15.75
Clean Brass Turnings.....	10.25 to 10.75
Composition Turnings.....	13.00 to 13.25
Lead, Heavy.....	5.00 to 5.15
Tea Lead.....	4.85 to 4.90
Zinc Scrap.....	4.90 to 5.10

Iron and Industrial Stocks.

NEW YORK, April 4, 1906.

Stocks have been very strong since our report of one week ago. Advances have been made in all the active stocks, and in some cases these advances have been decidedly marked. The coal strike appears to be regarded as a negligible matter, more attention being paid to the settlement of the Moroccan question and gold imports, while the increased earnings reported by the railroad companies have also been a factor in the betterment. The lowest and highest prices on active stocks from Thursday of last week to Tuesday of this week, inclusive, were as follows: Car & Foundry common 43½ to 46, preferred 101½ to 103½; Locomotive common 67½ to 71½; Colorado Fuel 65½ to 67½; Pressed Steel common 52 to 55½; Railway Spring common 56 to 57½; Republic common 30½ to 32½, preferred 101½ to 103; Sloss-Sheffield common 82 to 86; Tennessee Coal 148 to 152; Cast Iron Pipe common 47½ to 51½; United States Steel common 39½ to 43½, preferred 105½ to 109½. The United States Steel stocks have been exceptionally stimulated by the apparently well authenticated reports that the earnings for the quarter just ended were very close to the highest record ever made by the corporation. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common 9½, preferred 66½; Car & Foundry common 44½, preferred 103; Locomotive common 69, preferred 115½; Steel Foundries common 12½, preferred 46; Colorado Fuel 64½; Pressed Steel common 54½, preferred 99; Railway Spring common 56½; Republic common 32,

preferred 102½; Sloss-Sheffield common 85½; Tennessee Coal 151½; United States Cast Iron Pipe common 51½, preferred 93½; United States Steel common 42½, preferred 108½.

The Niles-Bement-Pond Company, 111 Broadway, New York, makes the following financial statement for the year 1905, including all constituent companies:

Net profit, after charging off all expenditures for patterns, drawings, maintenance and repairs to buildings and machinery.....	\$1,200,614.11
Set aside as reserve for depreciation.....	\$175,000
Dividends, preferred.....	253,500
Dividends, common.....	300,000
Profit sharing distribution.....	50,123
	778,623.00
Balance.....	\$421,991.11
Deduct bad accounts and charges applying to prior period.....	10,578.05

Added to surplus..... \$411,413.06

The Colorado Fuel & Iron Company has determined to issue \$2,000,000 par value of its common stock now in the treasury of the company and \$4,000,000 par value of the 5 per cent., Series B, bonds of the Colorado Industrial Company, which are now part of the free assets of the Colorado Fuel & Iron Company. The additional stock is to be sold to the stockholders *pro rata* at par, and the privilege is to be accorded to each subscriber for five shares of the stock to purchase \$1000 par value of the Colorado Industrial B bonds at 54. The official circular announcing the proposed issue of securities states that the stock and bonds are to be sold to provide necessary funds for capital expenditures for additional equipment of the company's plants.

The Fore River Shipbuilding Company, Quincy, Mass., has filed its initial statement as of December 31 last with the Secretary of the Commonwealth of Massachusetts, which shows: Assets—Real estate, merchandise and interests, \$3,648,240; merchandise and stock in process, \$574,371; cash and debts receivable, \$8,6956; cost of product and expense, \$5,504,360; insurance and taxes, \$7670; total, \$10,641,598. Liabilities—Capital stock, \$4,800,000; accounts payable, \$210,592; sales, \$5,475,732; profit and loss, \$155,274; total, \$10,641,598.

The annual meeting of the stockholders of the Bethlehem Steel Corporation was held in Newark, N. J., April 3. Chairman Charles M. Schwab submitted his first report. The earnings of the corporation for the year were \$3,313,929, from which deduct bond interest of corporation and subsidiary companies of \$548,530, leaving a balance of \$2,765,399. Deduct for depreciation of plant \$400,000, leaving the net income for the year \$2,365,399. During the year two dividends of 1¼ per cent. each were paid on the preferred stock, amounting to \$521,780, leaving a balance of surplus for the year of \$1,843,619. The sale of \$12,000,000 first extension mortgage 5 per cent. gold bonds to Fisk & Sons was ratified.

The Columbus & Hocking Coal & Iron Company, Columbus, Ohio, has increased its capital stock from \$7,000,000 to \$7,500,000, the increase to be in preferred stock.

The American Car & Foundry Company has issued the following financial statement for the quarter ending January 31, 1906:

Net earnings from operation.....	\$1,008,110.82
Dividend No. 28 on preferred stock.....	525,000.00
Surplus earnings for the quarter.....	\$483,110.82
Surplus October 31, 1905.....	12,698,485.28
Surplus January 31, 1906.....	\$13,181,596.10

Dividends.—Tennessee Coal, Iron & Railroad Company has declared a quarterly dividend of 1 per cent. on the common stock and 2 per cent. on the preferred stock, payable May 1.

Chicago Pneumatic Tool Company has declared a quarterly dividend of 1 per cent., payable April 25.

Rhode Island Perkins Horseshoe Company has declared the regular quarterly dividend of 1¼ per cent. and an extra dividend of 2 per cent., both payable April 14.

The Pope Tin Plate Company Not Sold.—On April 2 the option given last month by Charles E. Pope, president of the Pope Tin Plate Company, to the La Belle Iron Works, Steubenville, Ohio, at \$125 per share, expired and the option was not exercised. About March 15 the directors of the La Belle Iron Works held a meeting and voted to buy, but it seems there were legal difficulties in the way and this action was afterward rescinded. It is probable that nothing will be done in the matter for some time at least.

The election of the New York Metal Exchange, held April 2, resulted in the following officers being selected: President, Robert M. Thompson; vice-president, Adolph Lewisohn; treasurer, Robert L. Crooke.

The Machinery Trade.

NEW YORK, April 4, 1906.

Thus far the disturbances in the coal regions have not affected the machinery trade in this section, and it looks very much as if the threatened trouble had been discounted and that there would be no interference with business. In the trade the strike is rarely mentioned, merchants generally feeling satisfied that it will fizzle out with practically no ill effects; and consequently they seem unconcerned. It is the opinion that the operators are well prepared for any trouble, and that the miners have made a stand from which they will have to recede very soon. The failure of the strike to influence the machinery business is manifested in the very good trade which merchants have enjoyed for the past few months and are now experiencing. One of the most important manufacturers which has several very large plants, and it is not the exception, did as good a business in March as in any month in its history. This is the record of many if not all machinery houses in this territory. Not only has trade been of large volume, but has been very profitable, having been made up almost wholly of small and medium sized lots, very few large single orders having been taken. The continuance of a large volume of scattered orders demonstrates a healthy condition that augurs well for good trade for some time to come. During the week a \$20,000 and \$40,000 order were reported. There are a number of inquiries before the trade, but the majority of those that are of any size are of such a character that nothing tangible is expected in the immediate future.

The Intermountain Founders' and Machinists' Association has been organized by the foundry and machine shop owners of Salt Lake City, Utah, for the purpose of promoting general business interests, maintaining uniform schedules in prices, and to deal with the labor questions that are constantly before foundry owners.

Machinery Requirements.

The Pennsylvania Railroad proposes to install a 5-ton electric traveling crane in the second floor of the frame shop at Altoona machine shops, and the purchasing agent is now making inquiries for a crane suitable for such an installation. The crane will have to be of the minimum clearance type, with the trolley placed between the girders, so as to afford the best possible head room and lift from the second floor. Bids are also being asked upon a portable riveter of 80 inches, gap 15 inches between stakes, equipped with a compound hanger. The machine should have a capacity of 30 tons when operated under 1500 pounds' hydraulic pressure. A 72-inch riveter is also wanted. Two propositions are asked upon designing, furnishing and erecting complete with the exception of the excavation, piers and foundations, which will be furnished by the railroad company from the manufacturers' drawings, a coaling station, similar to one shown on blue prints which accompany the inquiries and conforming to the special specifications thereon, for handling bituminous, run-of-mine coal. Proposition No. 1 is to cover a bin of 200 tons' capacity, and proposition No. 2 is to cover a bin of 150 tons' capacity; the capacity in each case to be that which the conveyor buckets will deliver to it without having to resort to leveling off the top of the pile by hand to obtain these amounts. The structure proper is to be made of steel throughout, the bin floor and sides to be composed preferably of reinforced concrete, properly supported with structural steel. In addition to the foregoing, prices have been asked upon the following: A three-spindle cylinder boring machine capable of boring simultaneously high and low pressure cylinders and valve chambers on cross compound locomotives, but desired more particularly for handling the cylinders of class H6b locomotives, to be motor driven, motors to be arranged for 220 volts; the necessary heating apparatus for the frame shop at Altoona machine shop, to consist of fans, heaters, motors, ducts, piping, dampers, &c., as may be required; six turret head bolt cutters with dies to cut up to 1½ inch bolts, machines to be belt driven, and proposition to include dies.

The Erie Railroad has announced a further addition to its plans for getting the interurban traffic along its branch lines up New York State by electrifying its system in that direction, and accordingly surveys and estimates have been ordered for the electrification of the Rochester division of the road, from Corning to Rochester. Work has already been begun on a double track system along the route from Corning to Schenectady, and it is expected that within a short time other announcements will be made regarding additions in that vicinity. The company is constructing a large power house at Cornellville, which is to be used for the easterly interurban lines, and it is expected that power for the Rochester extension will be taken from Niagara Falls. The route which the Erie proposes to electrify is almost the same as that selected by the recently incorporated Interurban Railroad Company, organized by Otto Schultze and other associates of the United Copper Company. This company obtained franchises from Rochester to Corning and would, if the road was built, be in direct competition with the Erie

road, and it is expected that the Erie people are hurrying the work on their lines with the idea of getting them into commission before work on the proposed competing line is begun. The total mileage to be electrified, according to the announcement so far, amounts to about 170 miles, and it is expected that other announcements regarding similar improvements will follow. The electrification of the Rochester division will include the Bath & Hammondsport Railroad and a branch to Conesus Lake, as well as the Mt. Morris branch from Avon to Mt. Morris. Other extensions are to be decided on later, but it is declared by interests affiliated with the Erie Railroad that it is not improbable that in arranging for the transmission of power from Niagara Falls attempts will be made to get contracts for furnishing light and power along the line. All this will mean large expenditures in the way of machinery and it is not improbable that considerable of the buying will be done here. The Erie Railroad's main office in New York, including that of the purchasing agent and the chief engineer, as well as all the other offices now located in the two buildings on Cortland street in which the company occupies suites, are to be moved on May 1 to 11 Broadway.

The Walter Automobile Company, Trenton, N. J., has been purchasing machinery of late for its new plant there, and the Vandyck-Churchill Company has received a large order for machine tools, which, it is said, includes a greater portion of the requirements in that line.

J. L. Osgood, Buffalo, N. Y., has secured the contract for a considerable portion of the machinery to be installed by the George N. Pierce Company, manufacturer of automobiles, in its new plant which it is erecting at the southeast corner of Elmwood avenue and the New York Central belt line in that city. The cost of the machinery in this contract aggregates \$40,000, delivery to be made August 1.

As a result of the fire at the plant of the J. B. & J. M. Cornell Iron Works at Cold Spring, N. Y., on April 2, the company will probably soon be in the market for some machinery. We understand that the bridge shop, 120 x 650 feet, was completely destroyed and that the company will rebuild as soon as possible. It makes a great deal of its own heavy machinery and therefore will not probably purchase any great amount of new equipment to replace that which was destroyed. This building is only a part of its large works at that point, and as the company has several other large buildings there its facilities are such that the loss of this building will only interfere slightly with the work.

The announcement that the American Locomotive Company, 111 Broadway, New York, has purchased 50 acres of land adjacent to its Brooks Works, at Dunkirk, N. Y., has brought forth the information that a general addition is to be made to the Brooks Works. This is in addition to the extensive improvements now going on there, and when the company's plans are ultimately carried out there will be an enormous plant at that point. No announcement has been made by the company's officials as to what is the nature of the additions that are to be made on the land just purchased, but it is admitted that there will be general additions to the plant, although the plans have not as yet been completed. Whether the company intends erecting its proposed steel castings plant at Dunkirk has not developed as yet, but it will be remembered that it was announced about the first of the year that a castings plant would be built during the ensuing 12 months. The company has in the past contracted for most of its heavy castings used on locomotive work, and orders have been placed for the present year's needs. It is expected that the new castings plant will be built during the present year, and it is just possible that part of the land which has just been purchased may be used for this purpose. In any event the trade can look for some extensive purchases from that source in the near future. It is thought that all the buying for the additions now under way at both Schenectady and Dunkirk has been completed. The work at Dunkirk now going on includes the construction of a new foundry, 125 x 650 feet, a boiler shop and some additions to the machine shop. The company recently made additions to its department for the manufacture of Atlantic steam shovels at Dunkirk, and its plant there is one of the largest of the corporation's plants. There is also in course of construction at present a large locomotive erecting shop at Schenectady. This building will be 162 x 350 feet, and for some time past the company has been engaged in placing orders. Most of the requirements for that addition have been provided for.

Quite a lot of new machinery will shortly be purchased by the Enterprise Boiler Company, Youngstown, Ohio, whose entire plant and working equipment were recently destroyed by fire. The shops being completely consumed will cause the suspension of operations for some time, but it is the intention of the company to rebuild and resume operations as soon as possible. The company has in course of construction and new orders on its books to the amount of \$75,000 or \$80,000, 25 per cent. of which is practically completed and ready for shipment. For this work immediate arrangements will be made for portable machinery and tools to finish up the machines and make shipment.

The Casey-Hedges Company, Chattanooga, Tenn., has

been incorporated under the State laws of Ohio, with capital of \$900,000, all paid up, to manufacture boilers, engines, steam specialties and plumbers' cast iron goods. The company has purchased the plants and assets of the Casey & Hedges Mfg. Company and the Chattanooga Pipe & Foundry Company and intends to increase the boiler department to make it the largest south of the Ohio River, part of the present foundry being used to accomplish this. About \$150,000 will be spent immediately in the erection and equipment of four new buildings. One building will be 90 x 336 feet, another 50 x 135 feet, a third 80 x 255 feet and the fourth 60 x 200 feet, all being constructed of steel. President of the company and general manager is M. M. Hedges; assistant general manager, P. J. Casey; first vice-president, H. L. Probasco, and secretary and treasurer W. S. Todd.

Considerable mining machinery is required by the W. J. Rainey Coke Company, Connellsville, Pa., which is to install new mechanical plants for developing its large coal properties. The company expects to purchase heavy hoisting engines and drums, dynamo engine and dynamo, heavy mining pumps, fan engine and fan of 25 feet diameter. In addition to the opening up of new mines, 700 or 800 new coke ovens will be built.

The Berwind-White Coal Mining Company has awarded the contract for the construction of its proposed large car building and repairing plant at East Hollidaysburg, Pa. The company has about 50 acres of ground adjacent to the Pennsylvania Railroad there, and in addition to an erecting shop and a large machine shop there will be an extensive power plant and a repair plant. Details as to the size of the buildings to be erected are lacking, but as the company now owns 4500 cars of from 40 to 50 tons, and as it is expected that the new shops will take care of the repairs needed on them as well as be available for the construction of new cars, they will necessarily be large. It is said that it is intended to build a settlement adjacent to the car plant, which will be peopled by the employees of the company. It is not thought that the contract has been let as yet for the equipment, but the engineering department, which is located at Philadelphia, is taking up that question and most of the details will be arranged there. The company maintains an office at 1 Broadway, New York.

The Guggenheim interests are planning extensive development work in Alaska, where they intend to open up mines and build smelters that will necessitate the purchase of a great deal of new equipment. In view of the extensive improvements they have been making for some time to their properties in this country, which have entailed the purchase of a great deal of machinery, this branching out into other fields is important, in that it insures a further demand for machinery used in the production and smelting of ore.

Power Plant Specifications.

The Borough of Atlantic Highlands, N. J., is preparing to advertise for bids for furnishing equipment for the remodeling of the electric light and water plant of the municipality. The bids are to be received for the entire work or any part of the alterations, and specifications can be seen as soon as the advertisement of the bids is arranged for, either at the office of the borough clerk at Atlantic Highlands or at the office of Alexander Potter, 143 Liberty street, New York, who is the consulting engineer. The equipment needed includes one 150 horse-power cylinder engine for direct connection to a 100-kw. alternating current generator not to exceed 277 revolutions per minute; two 150 horse-power single cylinder engines for direct connection to two 100-kw. alternating current generators; two compound 150 horse-power engines direct connected to two 100-kw. generators; one 100-kw. revolving field or induction type belted generator, to be used on an engine now installed; two 100-kw. generators direct connected to one 125 horse-power horizontal return tubular boiler and one air compressor capable of delivering 175 cubic feet of free air per minute at a working pressure of 60 pounds to the square inch.

McLaughlin Bros., engineers and constructors, Baltimore, Md., will erect and equip a new piano manufactory for Charles M. Stieff, which will be 50 x 220 feet, of mill construction, five stories high. It has not yet been determined just what will be required in the way of boilers, engines and generators, but it is the intention to equip the plant with modern machinery and appliances and all machinery that goes into a modern power plant will be required.

Part, if not all, of the electrical equipment for the three complete hydro-electric plants, to be installed by the Inter-Mountain Power Company, Salt Lake City, Utah, will be purchased in this city. James J. Chambers, president of the company, will be at 912 Harrison Building, Columbus, Ohio, during the month of April, and will also visit New York for the purpose of purchasing the electrical equipment. One station will consist of four 750-kw. units, another station will consist of two 600-kw. units and a third station will consist of a 500-kw. unit. The impulse type of water wheels will be used throughout. A fourth unit of 750 kw. capacity will be installed next year, and work will be begun during the fall on a steam plant to comprise two 500-kw. units.

Catalogues Wanted.—Solon O. Friede, Harbin, Manchuria, has opened an import and export office, and will be

pleased to receive catalogues and price-lists from American manufacturers. Mr. Friede has spent the last six years in Manchuria and Siberia in the interest of an American export house, and is well posted as to the requirements for his territory.

New England Machinery Market.

WORCESTER, MASS., April 3, 1906.

The manufacturers of machine tools are getting farther and farther behind in making deliveries. This is the natural result of a protracted period during which orders taken aggregate an excess of shop capacity. There is no doubt that many manufacturers of this class of machinery would welcome a slight letting up of business, particularly of domestic orders, for general relief of the strain, and that more attention might be paid to the foreign market. Some German business is being received as a result of the postponement of the operation of the new tariff schedules aimed at American goods.

The hardware manufacturing industry of New England will be largely increased in capacity this season and many establishments will be large buyers of machinery. New Britain will see a very large amount of new factory building, some of which is already under way, and proportional increase will mark the growth of hardware business elsewhere.

Labor conditions in New England are entirely satisfactory, with a few minor exceptions which do not include machinists. A few instances of molders' strikes are reported from smaller places, and polishers and kindred trades are out in a very few works. The matter of wages has entered into a smaller percentage of trade differences than usual, which is to be expected because of very general advances which have been made, usually to individuals and not to bodies of workmen. Scarcity of labor in controlling wage prices has tended to remove the chief cause of differences between employers and employees. If differences were to arise this season intimation would have been given before now, as May 1 is the usual date set in ultimatums to employers and it is not known that any such demands have been made, excepting, as stated, in isolated cases where what are generally considered trivial reasons are the cause of disputes, the matters of hours and wages not entering into the demands of workmen.

The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., manufacturer of machine tools, announces that it has discontinued the manufacture of upright drills. The company will concentrate its efforts on its two other lines—planers and lathes. P. Blaisdell & Co., now merged in the Whitcomb-Blaisdell company, began the manufacture of upright drills in the early 60's. In fact, this type of tool was the firm's first product, antedating the manufacture of engine lathes. Formerly the line of drills ranged in size from 20 to 50 inch, but of late it was reduced to a range of from 20 to 30 inch. This drill was very well known in the trade. The change in the Whitcomb-Blaisdell line is a natural result of the modern tendency to specialize on a few lines rather than several, and as the company now has the Blaisdell and Draper lines of lathes as well as the Whitcomb planers, its product is sufficient without the drills.

It is announced in Portland, Maine, apparently from official sources, that the Maine Central Railroad is to make important additions and improvements to its repair shops at Thompson's Point, that city. An addition to the car shop will be built 130 x 180 feet, and an addition to the mill plant 60 x 140 feet. The changes will include improvements in the coal handling plant. None of the other shops of the Maine Central system will be affected, according to this statement, the enlargement of the Thompson Point shops being made necessary to relieve a congested condition of repair shops resulting from an increase in the company's equipment.

The Hawthorne & Sheble Mfg. Company, Philadelphia, manufacturer of talking machine supplies, will establish branch works at Bridgeport, Conn., for the purpose of taking care of the demand in New England, particularly for the Columbia Phonograph Company and the American Graphophone Company, Bridgeport. It is planned to erect a factory building 56 x 412 feet, two stories, with all modern facilities and new machinery for the manufacture of horns, horn cranes, carrying cases, small parts and other supplies. The Hawthorne & Sheble Mfg. Company is a Pennsylvania corporation. Ellsworth A. Hawthorne is the president, Horace Sheble vice-president and treasurer and C. W. Noyes secretary.

The Merrimac Iron Foundry, Lawrence, Mass., manufacturer of iron castings, is to erect an entirely new plant in that city. Plans are now being prepared by Arthur F. Gray, 509 Exchange Building, Boston, for a group of buildings. A general foundry building will be 100 x 200 feet and will contain two cupolas, one with a capacity of 12 tons an hour, the other of about 7 tons. The building will be equipped with traveling cranes and other apparatus for the economical handling of materials and product. A building 75 x 100 feet will be devoted to cleaning and shipping departments. Both these structures will be of steel construction. There-

will be a three-story brick building, 36 x 86 feet, devoted to offices and pattern storage, and a power-house, 33 x 43 feet. All power will be electrically transmitted. No contracts for any part of the equipment or materials have been let. Mr. Gray has the complete plant in charge, including equipment.

The Bigelow Company, New Haven, Conn., manufacturers of steam boilers, is to extend its works and enlarge its business. The capital stock has been increased from \$60,000 to \$300,000, which will afford funds for large additions to the company's plant, and for the general expansion of the business. The important announcement is made by the company in this connection that it has acquired the American rights for the manufacture of the Hornsby water tube boiler, which has had unusual success in England, where it is built by Richard Hornsby & Sons, Grantham. Details of the proposed building plans of the Bigelow Company are not yet available. The business is an old one, and the Bigelow boilers are widely and favorably known in the trade. A recent number of the *Electrical Review*, London, in a description of the new power station of the Charing Cross & Strand Electric Supply Association, at Bow, London, goes into details of a pair of these boilers erected as one steam unit, and forming "probably the largest steam producing unit in the world." They are constructed for a working pressure of 160 pounds; each has a heating surface of 10,850 square feet and a grate area of 168 square feet, the normal evaporation per hour being 33,000 pounds of water. Each boiler in working order contains 78,440 pounds of water and occupies an area of 18 feet 9 inches by 27 feet. "The pair has been steamed at the rate of 100,000 pounds per hour and so will easily provide steam under ordinary working conditions for a 4000 kilowatt generating set."

The Malleable Iron Fittings Company, Branford, Conn., is replacing the remaining old part of its plant with a modern building, of brick and steel construction. An addition is also being made to the office.

Johnson & Bassett, Worcester, Mass., manufacturers of woolen machinery, are to build an addition to their works, six stories in height, to contain about 12,000 square feet of floor space. The building will be used as an addition to the firm's machine shop facilities, and considerable new machine tool equipment will be required, the list not being ready as yet. The firm plans to build an entirely new plant on land adjacent to the Boston & Albany Railroad, acquired for the purpose, but is unable to carry out these plans for the present because the grade of the tracks as it will be when the scheme of abolishing grade crossings is carried out is not yet determined. Consequently it became necessary to build an addition to the present works to take care of increased business.

The Brainard & Wilson Company, Incorporated, Danbury, Conn., manufacturer of art metal goods, is to erect an entirely new plant in that place. The main factory will be 32 x 150 feet and two stories, with two wings, respectively, 32 x 48 feet and 26 x 40 feet.

The Meriden Fire Arms Company, Meriden, Conn., is preparing to begin the erection of large additions, which were referred to in this column some time ago. The new machine shop building will be 40 x 230 feet and one story, and a new power house will also be erected. The company will require a large amount of machine tools.

The Herald Machine Company, Worcester, Mass., is contemplating the erection of a large addition to its works at Barber's Crossing. The present building is 90 x 100 feet, and the new part as planned will have the same dimensions, doubling the available floor space. The shop is crowded at the present time, the business having grown very rapidly of late. This is especially true of the company's disc grinder and the cylinder grinder, which are in great demand, especially by manufacturers of automobiles and combustion engines generally. Much of the new space will be devoted to erecting floor, which will relieve the present somewhat cramped conditions resulting from increased manufacturing requirements. The matter is not entirely settled, requiring the formal action of a directors' meeting, which comes early in April.

The fire in the plant of the Whitlock Coil Pipe Company, Hartford, Conn., destroyed the iron coil shop, Department No. 4, the loss being \$25,000. The company plans to replace the building, on a somewhat larger scale.

The New England Steel & Copper Plate Company, 730 Chapel street, New Haven, Conn., is in the market for a new engine and boiler, to provide power to operate its plant, replacing electric motor power.

Wilson & Smith, Worcester, Mass., have special facilities for heavy metal punching for the manufacture of such articles as gear blanks for automobile sprockets, collars for axles, heavy washers, wrenches and similar work.

It is reported that a new six-mill sheet plant will be built this summer between Lowellville and Struthers, Ohio. James Patterson, formerly connected with the Struthers Works of the American Sheet & Tin Plate Company, is said to be identified with the project.

Philadelphia Machinery Market.

PHILADELPHIA, Pa., April 3, 1906.

The total volume of business transacted in the local machinery market during the month of March was greater in proportion than that for either the months of February or January. The buying has been of the same general nature as has characterized the market since the first of the present year, the bulk of the business being made up of a large number of small orders covering a variety of tools. Buying by the various railroads has been light, no specifications covering any extensive equipment having been before the trade during the month just closed. Almost all of the railroad buying recently has been for single or a few tools for replacement or for minor extensions and on which, as a rule, good deliveries are expected.

Heavy machine tools were in better demand during the past week and several sales have been made. The greater proportion of the business, however, has been made up of a number of orders for medium and smaller tools.

The unsettled condition of the coal mine labor situation continues to have an important bearing on future business. The recent conferences which have terminated rather unsatisfactorily to both operators and miners of bituminous coal, and what the outcome will be in this as well as to-day's conference between the anthracite operators and their employees, is awaited with considerable interest.

In many cases manufacturers have already protected themselves against a shortage in the supply of fuel, and instances are to be noted where supplies are on hand sufficient to keep the plants running until October, November, December, and in a few cases even until the first of next year.

Manufacturers as a rule are taking a favorable view of the present situation. Order books are well filled, shops are running full, and in a number of cases overtime to meet the present demand. Deliveries do not seem to improve, but on the contrary have in a number of cases become more extended. Some manufacturers are refusing to name date of delivery until matters assume a more tangible shape.

Foreign trade has improved slightly during the past month. While there has been no extensive demand for the general run of tools made in this section, there have been some good gains in the field of special tools and appliances as well as in power transmission specialties. The general machine tool situation does not improve very rapidly, and if it should manufacturers would probably find it impossible to make deliveries, owing to the volume of domestic business now on their books.

The second-hand engine, boiler and machinery trade has been active. The demand for the higher powers of engines and boilers keeps up well, while that for heavy machine tools has been very good, and the latter are now hard to obtain, particularly in the better grades.

Castings continue in good demand. Steel casting plants are having as much business offered as they can take care of; in some cases they are unable to take the business and make the deliveries desired. Gray iron foundries are taking on large tonnages, and are producing on an average nearly up to their full capacities. Deliveries of gray iron castings are said to be materially improved.

Morse, Williams & Co. have had plans prepared by Ballinger & Perot, architects and engineers, for an addition to their smith shop at Wilkey street and Frankford avenue. The building will be of brick and reinforced concrete, 44 x 68 feet.

The Eynon-Evans Mfg. Company notes a constantly increasing volume of new business. The demand for condensers and blowers has been taxed to meet customers' requirements for brass and bronze castings, particularly for the acid resisting class of the latter for use in mine work. Orders for blowers for gas producers have been enormous, and a recent order for seven No. 7 blowers, delivering 500,000 cubic feet of air per minute, under 2-inch counter pressure, for a large steel plant for use in firing 1000 horse-power boilers is to be specially noted. Two 500-kw. and one 1000-kw. surface condensers have recently been completed by this company, for the New England Engineering Company, for a plant at Jayenese, W. Va.

The American Pulley Company reports a steady business, both from foreign and domestic sources, the volume for the month having been if anything greater than that of the previous month or so. Heavy shipments of pulleys have been made for export to New Zealand, Australia and Continental European countries. The New England and Middle Western States have been the heaviest domestic shipping points recently, although the demand in this territory has also been somewhat better than usual.

The Standard Pressed Steel Company notes that its March business was the largest for any individual month in its history. Foreign trade has increased, while the domestic trade in the Atlantic and Middle Western States has been very much improved. Large shipments of wrought

steel hangers have been made for export to South Africa and European points, as well as to a number of South American countries. A number of large individual contracts have been completed, others are now in prospect, and prospective business is considered very favorable.

The Stoeber Foundry & Mfg. Company, Myerstown, Pa., is quite busy. Business during the past few months has been in excess of that for the corresponding periods during the past few years, and the plant is fully occupied in all departments. A number of improvements to the plant are contemplated during the coming summer, but nothing definite has as yet been decided upon.

The Betts Machine Company, Wilmington, Del., is busy both in the machine shop and foundry. The plant is being operated both day and night, and work is on hand sufficient to keep fully occupied for many months ahead. A number of additional tools have recently been added to the company's equipment, and it is now contemplating an addition to the erecting shop.

The Link Belt Engineering Company is busy in all departments. There has been a good inquiry for all classes of hoisting and conveying machinery, and orders have been booked among others for a sand handling equipment of 75 tons capacity for the Dunkirk plant of the American Locomotive Company, a retarding conveyor handling 500 tons per hour for the New River & Pocahontas Consolidated Coal Company at Gentry, W. Va.; a barrel elevating equipment for the new warehouse of the Central Railroad Company at Newark, N. J., and a number of ball bearing turntables for the Butler Car Wheel Works, Butler, Pa. A number of concrete measuring and mixing machines have been furnished different customers and a large amount of elevating and conveying machinery for retail coal pockets and for general coal mining purposes has been completed for various concerns.

The Hilles & Jones Company, Wilmington, Del., reports the volume of new business taken in March being greater than that in January and in February, while the actual output exceeded any previous month in the company's history. Among the work under construction and now in the erecting shop is a group of ten heavy plate shears, ranging in width from 50 up to 125 inches between hoistings. The company is also completing a contract for large tools for the King Bridge Company, Cleveland, Ohio, this contract including a heavy double angle shear, plate straightening rolls, multiple punches and gate shears, and a single plate punch with 60-inch depth of throat.

The Royersford Foundry & Machine Company, Royersford, Pa., has a good volume of business in hand and all departments of the plant are fully occupied. There has been a large demand for power transmission machinery as well as for punch and shears. The former line has been delivered to purchasers in various sections of the country, while a No. 1 punch and shear was recently shipped to the Lewisburg Wagon Company, Lewisburg, N. C., and several of different sizes have been furnished parties in New York.

Chicago Machinery Market.

CHICAGO, ILL., April 3, 1906.

Announcement has just been made by the Chicago & Northwestern Railroad that it will build large shops and extensive terminal at Janesville, Wis. Upward of 300 acres of land have already been purchased, and while the plans are incomplete at present it is estimated that the work of erecting the shops and terminals will not be completed in less than two or three years. The cost of these improvements is variously estimated at from \$2,000,000 to \$3,000,000, and the shops will be the largest of their kind in the West. The company's largest shops are now located in this city, but ground limitations compel the company to seek a site elsewhere. The congestion at Chicago will also be greatly relieved by the construction of this terminal, as it is the intention to make up many of the trains consigned to the Northwest at this point. Extensions are now being made to the shop facilities in this city, but these additions will prove inadequate to meet the rapid growth in traffic in the next few years. It is altogether probable that car shops will be included in the Janesville plant, although nothing definite as to this is yet obtainable.

The Wabash Railroad is also building new car repair shops at Decatur, Ill. Contracts have already been let for 15 buildings to James Stewart & Co., St. Louis, which, when completed, will provide facilities three times as great as are now available at that place. The passenger shop will have a capacity of 28 cars a day and the freight shops will be large enough to accommodate 200 freight cars. There will also be facilities for building new equipment. A large amount of machinery is to be installed, and contracts will be placed through the company's St. Louis purchasing department. The list covering the necessary tools and equipment will shortly be issued.

The Cleveland, Cincinnati, Chicago & St. Louis and the Lake Erie & Western Railroads have purchased 2460 acres of land in the southeast limits of Indianapolis, Ind., where they will build large erecting and repair shops at a cost

approximating \$2,000,000. The machine shop will be 300 x 800 feet, with an annex 300 x 400 feet. This new railroad plant will be known as Beach Grove. George W. Kittredge, chief engineer, Cincinnati, Ohio, is in charge of the improvements. The Big Four will also erect new shops at Mt. Carmel, Ill., the mason contracts of which have already been let to H. Eilenberger & Son, Chicago. The cost of these buildings is estimated at \$75,000.

The additions that are now being made to the plant of the Power & Mining Machinery Company, Cudahy, Wis., include the installation of six exceedingly heavy machine tools. The specifications for these tools have already been issued, and while no contracts have yet been let it is probable that they will be closed shortly. The tools to be installed are as follows: One 16 x 20 boring and turning mill of extra heavy pattern, weight 260,000 pounds; weight of the central boring bar, 15,000 pounds; one extra heavy 10-foot planing machine, weight 170,000 pounds; one horizontal boring, drilling and milling machine, having a column travel of 10 feet, saddle travel 8 feet, spindle travel 6 feet, spindle diameter 6½ feet, floor plate 14 x 16 feet; one belt driven 25-inch slotter table, 53 inches diameter, longitudinal traverse 60 inches, cross travel 48 inches, height between table and arm 30½ inches, weight 42,000 pounds; one 10 x 10 x 20 foot planer with four heads; one 10 x 10 foot planer to plane 20 feet long, weight 120,000 pounds. The new addition to the foundry mentioned in the last issue of *The Iron Age* will be 220 feet long and 70 feet wide, with a 45-foot bay, which will more than double the present capacity. The cupola now in operation in the old foundry has an inside diameter of 55 inches and has a capacity of from 10 to 12 tons per hour. The new cupola will be of the McCormick-Colliau type, and will have an inside diameter of 72 inches and a capacity of from 15 to 18 tons an hour, and the daily output of the foundry will be increased to approximately 200 tons. Castings weighing up to 120,000 pounds are now being poured, and still larger sections can be cast with the increased melting capacity. The new crane equipment will consist of two 30-ton traveling cranes for the main floor, two 15-ton cranes for the wings and five 5-ton cranes for operating underneath and independent of the large 30-ton cranes. When these new improvements are completed 300 additional men will be employed, which will bring the total up to 1000. Since this company acquired the plant of the Holthoff Machinery Company the capacity of the works has been more than doubled but is still inadequate to handle the immense amount of business now on the company's books. The company has opened an office at 312 Seventeenth street, Denver, Col., placing in charge as district manager Henry F. Jurs. This new office will cover the States of Colorado, Wyoming and New Mexico. Mr. Jurs was recently connected with the A. Leschen & Sons Rope Company, St. Louis, as Western manager in Denver, and previous to that time held several important positions with the Union Iron Works and the Baker & Hamilton Company, both of San Francisco, and was for a time manager of the latter company's shops at Benicia, Cal.

The Downie-Wright Mfg. Company, York, Neb., has completed arrangements for removing its plant to Rapid Creek, Neb., where a plant comprising four buildings will be erected, including a foundry, machine shop, machinery warehouse and office building. The company manufactures mining and milling machinery and also acts as representative of other concerns manufacturing a similar equipment.

The American Drill Company, Springfield, Ohio, will remove its factory about May 1 to Marion, Ind. A site has been selected on the belt line which surrounds the latter city and a plant will be erected with a capacity of 10,000 drills per year and giving employment to 500 men. The new plant will include the following buildings, work on which will begin shortly: One 50 x 300 feet, two stories and basement; one 50 x 200 feet, two stories and basement; a foundry, 50 x 150 feet; storeroom for materials, 40 x 150 feet; wood work and paint shop, 50 x 150 feet, and electric power plant, 40 x 60 feet. The belt line serving the plant connects with six railway systems, giving excellent transportation facilities. Although work will be pushed rapidly on the construction of the new plant the spring trade will be taken care of from the Springfield factory.

The Brandon Machine Works Company, Limited, Brandon, Manitoba, manufacturing a line of portable steam engines and boilers and doing a general jobbing business in brass fittings, castings, supplies, &c., has recently added the manufacture of gasoline engines, which has necessitated doubling the capacity of machine shop and foundry. Several high speed lathes and a planer have been purchased from John Bertram & Sons Company, Dundas, Ontario, and the A. R. Williams Machinery Company, Winnipeg, and a little later a further addition of several more lathes and a boring mill will be made. The company is now erecting a new blacksmith shop and as soon as the frost is out of the ground will commence the erection of a new warehouse and office building on property recently purchased opposite the present works. This building will be 75 x 120 feet, two stories in height, and will contain the general offices, showroom and warerooms and will be used in the jobbing branch of the

company's business, which has been steadily growing and which includes a full line of general machinery supplies.

The plant of the National Electric Company, Milwaukee, Wis., was sold at auction by the referee in bankruptcy March 26 to Charles L. Sullivan of Chicago for \$500,000. Mr. Sullivan is president of the Chicago Handy Car Equipment Company, but it is reported that the purchase of the plant was made in the interest of the Westinghouse Electric & Mfg. Company, Pittsburgh. Following the sale the purchasers incorporated the Wisconsin Brake & Electric Company, which takes over the National Electric Company. The capital stock of the new company is \$5000, which is only nominal and to meet the requirements of the law. P. H. Westinghouse, a brother of George Westinghouse, spent some time in Milwaukee last week and it is stated completed negotiations for the purchase of the 10 acres of property upon which the buildings of the National Electric Company are situated, which gives credence to the report of the identity of the purchasers of the company. The property has heretofore been held under lease, the lessee having the privilege of purchase, and the consideration named for the transfer of the land is \$35,000. It is stated that the Westinghouse interests will not only continue active operations as the Milwaukee plant, but will add the manufacture of several devices from their own plants, enabling the better handling of the Western and Northwestern demand. The number of employees at the plant will be increased within a short time. By the sale of the company creditors received dividends amounting to 40 per cent. The National Electric Company was organized by N. A. Christensen under the name of the Christensen Engineering Company and was later succeeded by the National Electric Company, both concerns manufacturing under air brake patents of Mr. Christensen. It is stated that the total assets purchased for \$500,000 were worth \$1,350,691. Of the claims against the bankrupt company more than \$1,100,000 had been purchased by the Standard Trust Company, New York.

The Berrien Springs Power & Electric Lighting Company, Berrien Springs, Mich., has had plans prepared for the construction of an electric transmission plant which will generate approximately 12,000 horse-power and cost \$1,000,000.

Bids will be received by the city of Joliet, Ill., until April 9, for furnishing and erecting a 3,000,000-gallon high duty pumping engine.

The city of Grand Island, Neb., is in the market for water tube boilers, automatic stokers, two high speed engines, two alternating current generators, coal and ash handling equipment, &c., for a new electric lighting plant. Bids will be received until April 14.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 3, 1906.

The week's business shows up in a very satisfactory manner, there being a fair influx of new orders. The foreign demand continues to show great strength and is really one of the strong points in the activity in the machine tool trade. Considerable anxiety is felt among manufacturers generally as to the ability of the coal men to meet demands that will be made upon them in the event of a protracted strike. It is known that there have been immense quantities of coal piled in anticipation of just such an emergency, but whether this will suffice to meet all requirements is a very uncertain proposition and entirely contingent on the duration of the strike.

Reports indicate that there is some little trouble brewing among the molders, and as a result the foundrymen are anxiously awaiting developments. They are agitating the question of a nine-hour day with \$3.25 pay straight, as against ten hours and \$3 at present. Should developments along this line prove to be of serious import it will be embarrassing to machine tool builders just at this time, when the question of being able to secure standard castings is of very great importance, and one which at its best is fairly uncertain.

The Dean Gas Engine & Foundry Company's plant at Front street and Washington avenue, Newport, Ky., suffered a disastrous fire this past week, which will seriously interfere with its business for several weeks. The company will begin at once the work of rebuilding.

Secretary Finch states that the Industrial Bureau has several plants that it is negotiating with, hoping to have them locate in this city. These comprise a manufactory of soil pipe and engines which contemplates quite an extensive foundry in connection therewith. The matter is being quietly handled, and it may be several weeks before definite conclusions shall have been reached.

Sealed proposals will be received at the office of Coppock & Coppock, Mercantile Library Building, Cincinnati, Ohio, on or before April 18, for two horizontal tubular boilers set complete in brick work with breeching, to be erected in the pump house on the hospital grounds. Instructions, together with plans and specifications, can be had at Longview Hospital, of which Charles H. Smith is secretary.

A large addition to the Lunkenheimer Company's plant

is being arranged for. This building, which will occupy possibly an acre of ground, will be utilized for the manufacture of steel, semisteel and gray iron castings required by the company. The building and machinery will probably cost \$200,000. Plans are now being drawn and will be submitted for approval in a short time.

The Bradford Machine Tool Company reports an unprecedented business, which is very general in its character. A new building is being erected, which will be 60 x 75 feet, where the lathes will be assembled and mounted.

President Frank Whittaker and Vice-President O. M. Bake of the Miami Valley National Bank, Hamilton, Ohio, are reported to be negotiating for a blast furnace near Hamilton that will have a capacity of about 200 tons per day.

The Atlas Wire Fence & Post Company, Toledo, a \$50,000 corporation, has secured temporary quarters on Water street, near Cherry, and is looking for a permanent location. The following are directors: F. E. Humphrey, Edwin Taft, T. A. Wright, William B. Phillips and F. C. Black.

Carl Ricker of the Portsmouth Pressed Steel Company, whose headquarters were formerly with the Portsmouth Foundry and Machine Works, will of necessity be compelled to establish an office of his own, as the Portsmouth Foundry & Machine Works plant has been dismantled and all of the machinery sold.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 3, 1906.

There is quite a diversity of opinion among local dealers as to the condition of machinery business in this district just at present. Some of them say that business has been very quiet the past two weeks, and they attribute it to the talk of coal strike and the inclination of manufacturers to hold off buying any more machinery until they find what the business situation will be in case of a strike, while other machinery dealers say that business has been unusually brisk of late. A number of concerns which have factory additions under construction have been buying. There has been considerable buying for both immediate and future delivery among the automobile makers. These concerns are well along with the outputs for this year and are finding it necessary to install more machinery in order to finish up as soon as possible, and they are taking almost any tools that they can find on the floors for immediate delivery. The orders for future delivery are largely for tools for special work and are for deliveries next fall, when the production of next year's machine is under way.

The Timpkin Roller Bearing Company, Canton, which is making quite an extensive addition to its plant, has been buying a number of tools on the Cleveland market and has inquiries out for more.

The Cleveland Twist Drill Company has awarded a contract for the erection of another large addition to its plant. The building will be 45 x 200 feet and five stories high of brick and steel construction.

The Acme Machine Company has commenced work on its factory addition which will be 80 x 100 feet. It will be used as an erecting shop, and will be covered by a crane.

The Cleveland Armature Works Company has commenced work on a new building, 44 x 135 feet, and four stories high. The company does electrical repair work of all kinds and manufactures motors from the smallest sizes up to 10 horse-power. It is preparing to build larger machines up to 25 horse-power.

The Brown Fence & Wire Company is preparing to erect a new factory building on East Seventy-ninth street. The plans provide for a two-story brick building, 108 x 190 feet.

The Haughton Elevator & Machine Company, Toledo, states that it has purchased property adjoining its present factory and will erect a three-story building, 66 x 100 feet. It will be used for offices and pattern storage, and the present offices, drafting room and pattern storage, will be utilized for shop room, and the company states it will soon be in the market for considerable new machinery and equipment, but just what it cannot state at this time.

The Union Fire Arms Company, Toledo, is erecting a factory addition, 40 x 210 feet and two stories high. The buildings will be used for offices, stockroom, assembling room and wood working department. The present building will be devoted entirely to machinery, and some additional tools will be purchased. George B. Colton is president and general manager of the company.

The Ralston Steel Car Company, Columbus, is preparing to increase the capacity of its plant, but it has not been decided what will be the capacity of the new buildings nor what machinery will be installed.

The Electrical Products Company, Ravenna, Ohio, has been incorporated with \$250,000 capital stock. W. B. Marshall, superintendent, states that the company will erect a plant for the manufacture of carbons and other electrical products.

The Christum Company, Massillon, Ohio, is preparing to erect a factory, 65 x 250 feet, and it will install several steam hammers, engine lathes and pipe threading machinery.

The commissioners of Stark County, with offices at Akron, Ohio, are securing estimates on the cost of installing an electric lighting and steam heating plant to light and heat the county buildings.

Homer T. Yaryan of Toledo is forming a company with \$100,000 capital stock, with a view to erecting a co-operative artificial ice plant with a capacity of 200 tons daily.

The Toledo Shipbuilding Company, Toledo, has secured a contract for two 7500-ton freight vessels; one of them for the L. C. Smith Transit Company and the other for a syndicate headed by Frank E. Kirby. The Toledo Shipbuilding Company has just let a contract for the erection of a new concrete pattern shop, a boiler shop and a power house.

The Studebaker Company of South Bend, Ind., has acquired an interest in the Garford Company of Elyria, Ohio. As stated in a recent issue, this company has just increased its capital stock from \$400,000 to \$650,000, and is preparing for the erection of a large plant at Elyria. The plant will be utilized largely in the manufacture of commercial vehicles, which will be marketed through the Studebaker branches throughout the country.

Government Purchases.

NEW YORK, April 3, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 17 for a quantity of supplies for the Portsmouth, Boston, New York, League Island, Washington and Norfolk navy yards, including motor generators, hydraulic jacks, engine lathe, &c.

Bids will be received until April 10 at the office of the United States Engineer, Wheeling, W. Va., for engines, boilers, pumps and other apparatus for lock No. 4, Little Kanawha River, West Virginia.

The following bids were opened March 27 for supplies for the navy yards:

Bidder 8, American Supply Company, Mobile, Ala.; 24, Buffalo Forge Company, Buffalo, N. Y.; 33, Chicago Pneumatic Tool Company, New York; 79, Handlan-Buck Mfg. Company, St. Louis, Mo.; 110, Manning, Maxwell & Moore, Incorporated, New York; 133, Pedrick & Smith, Germantown, Philadelphia, Pa.

Schedule No. 397.

Class 12. One pipe bending machine—Bidder 33, \$135; 79, \$130; 110, \$130; 133, \$150.

Class 13. One compound lever and pinion slitting shear—Bidder 24, \$49; 110, \$33.30.

Class 14. One compound lever and pinion gap shear—Bidder 110, \$33.30.

Class 15. One hand punch—Bidder 8, \$68.75; 24, \$72; 79, \$60; 110, \$69.

The following bids were received March 24 for turbo-alternators and accessories for the New York Navy Yard:

Westinghouse Machine Company, New York, item 3, \$39,532; 4, \$40,732.

General Electric Company, Schenectady, N. Y., item 1, \$45,678; 2, \$45,696.

Allis-Chalmers Company, Milwaukee, Wis., item 3, \$33,500; 4, \$34,300; add \$1600 for exciter set.

The following awards have been made for machinery for the navy yards, bids for which were opened March 6:

Drew Machinery Agency, Manchester, N. H., class 13, one geared trimming press, 4-inch stroke, \$1294; class 14, one trimming press for trimming drop forges, \$626.

Ajax Mfg. Company, Cleveland, Ohio, class 16, one heading, upsetting and forging machine, \$1825.

Chandler & Farquhar Company, Boston, Mass., class 17, one back geared crank shaper, \$360; class 19, one high speed planer with two heads, \$925.

Pratt & Whitney Company, Hartford, Conn., class 18, one die sinking machine, \$890.

American Wood Working Machinery Company, New York, class 31, one double cabinet makers' saw, complete with motor, \$545.

Class 15, one forging machine, has been canceled.

Under bids opened March 13 for supplies for the navy yards the Crocker-Wheeler Company, Ampere, N. J., has been awarded class 103, one 5 horse-power motor, \$200.50.

Sherman-Brown-Clements Company, New York, class 42, two hydraulic jacks, \$65.90.

J. B. Roache, Brooklyn, N. Y., class 82, three hydraulic jacks, \$116.60.

Hisey-Wolf Machine Company, New York, class 83, one portable electric bench grinder, \$85.

The following awards have been made for supplies for the navy yards, bids for which were opened March 20:

Brown Hoisting Machinery Company, New York, class 11, four 1-ton turntables, four 1-ton trolley blocks and two ½-ton trolley blocks, \$1160.

J. B. Roache, Brooklyn, N. Y., class 42, one 4-ton, two 7-ton and one 10-ton hydraulic jacks, \$141.80.

Manning, Maxwell & Moore, New York, class 44, one boiler tube cutter and one drill press, \$62.25.

Baker & Hamilton, San Francisco, Cal., class 45, one handy billy pump, \$52.

Drew Machinery Agency, Manchester, N. H., class 47, one valve reseating machine, \$131.

Commercial Electrical Supply Company, St. Louis, Mo., class 95, one 35 horse-power electric motor, \$485.

Sherman-Brown-Clements Company, New York, class 159, three hydraulic jacks, \$115.49.

Manhattan Supply Company, New York, class 163, one swivel claw hydraulic jack, 12 galvanized iron barrels and four dozen leveling jacks, \$97.75.

The Fairbanks Company, New York, has been awarded class 81, one 16-inch screw engine lathe, \$920, under bids opened February 20 for naval supplies.

Under bids opened February 27 for supplies for the navy yards the American Well Works, Aurora, Ill., has been awarded class 13, one 12-inch rotary well boring machine and one heavy link motion reversible drilling engine, \$645.

Resignation of Secretary F. R. Hutton.

It is not generally known among the members of the American Society of Mechanical Engineers that Prof. F. R. Hutton, who has been the secretary for nearly 25 years, presented to the council at its meeting in January his letter of resignation. It is his belief that the work of the society now requires a secretary who can devote his whole time to the office. Professor Hutton's position as head of the department of mechanical engineering of Columbia University makes it impracticable for him to do this. The resignation was not accepted, but will be referred to the members of the council who were not present at the January meeting, and it is hoped that some compromise may be effected which will allow the retaining of the services of Professor Hutton for the conducting of meetings and certain other functions in which he has been heretofore indispensable, and that another man may be employed to attend to the detail work of the secretary's office. The latter will have the title of secretary, and it is suggested that Professor Hutton be designated as honorary secretary. At the meeting of the council March 27 this general plan was approved and a special committee was appointed to select a new man and arrange the details of the suggested change.

A complimentary dinner was tendered to D. M. Forker of the Republic Iron & Steel Company March 31 at the St. Nicholas Hotel, Cincinnati, by the pig iron selling agents of the city. Mr. Forker, who has represented his company in Cincinnati for about five years, has been transferred to the general offices at Pittsburgh. As a token of the respect and esteem in which he was held by his competitors the idea was conceived of having all the representatives of the pig iron trade meet and wish him success in his new field of labor. Covers were laid for 15, all being present excepting James A. Green of Matthew Addy & Co., who sent a letter expressing his regrets at being unable to be present, having been unavoidably called away from the city. Robert Field acted as toastmaster and expressed the regret of the trade at the loss of Mr. Forker, but hoped that his successor, M. E. McKee, who was present, would prove to be a worthy successor. Speeches were made by J. K. Pollock of Rogers, Brown & Co.; Buckner Wallingford of Walter, Wallingford & Co., and others, to which Mr. Forker feelingly responded. Those present were: Willard Wilson, Tennessee Coal, Iron & Railroad Company; S. H. Whitaker, Dayton Coal & Iron Company; John Sargeant and C. H. Jenkins, Domhoff & Joyce Company; W. G. Eaton and Herbert Black, Hickman, Williams & Co.; J. K. Pollock, Rogers, Brown & Co.; W. H. Knight, D. M. Forker and M. E. McKee, Republic Iron & Steel Company; Buckner Wallingford and Robert Nicholas, Walter, Wallingford & Co.; Robert Field, Robert Field Sales Agency; J. D. Morten, *Iron Trade Review*, and F. R. Lindsley, *The Iron Age*.

The annual meeting and dinner of the Worcester Metal Trades Association, Worcester, Mass., will be held on April 24, 1906. James A. Emery, New York, formerly attorney for the San Francisco Citizens' Alliance, and Geo. B. Hugo, president of the Employers' Association of Boston, will speak.

A Partial Strike in Soft Coal Fields.

The past week has been an eventful one for the miners and operators in both the bituminous and anthracite coal fields. The United Mine Workers, following the disagreement of the conference of operators and miners at Indianapolis, decided at their meeting of Friday, March 30, to sign agreements with any bituminous operators who would agree to pay the 1903 scale giving an advance of 5.55 per cent. for the next two years. This made it certain that the bituminous coal strike would not be general. Before leaving Indianapolis President Mitchell issued an order calling on the union miners in the anthracite field to stop work on March 31 pending the conference between anthracite operators and the union's committee in New York. This conference began on Tuesday, April 3, and after a session of some hours adjourned until Thursday, April 5. There was no disposition on either side to recede from the positions already taken and no proposal of a modification of the original demands was made. The miners reiterated their statement that the proposition of the operators for a renewal of the present agreement was not accepted. President Baer of the Reading Railroad is quoted as saying that in his opinion not much would be accomplished, seeing that the men representing the miners have not the power to treat finally. They can make war but cannot make peace, an agreement requiring the sanction of a convention of the miners.

President Mitchell said on the adjournment of the Indianapolis convention that over 50 per cent. of the bituminous tonnage was ready to sign the agreement calling for the scale of 1903. The principal company accepting these terms is the Pittsburgh Coal Company, which signed the scale on Monday, April 2. Some independent operators in the Western Pennsylvania district also signed, as have some independent operators in Ohio, Indiana and Illinois. Thus far there has been no important break in the ranks of the resisting Ohio, Indiana and Illinois operators. On Monday none of the mines in the Monongahela Valley were in operation, and it is reported there is some dissatisfaction among the men, and a disposition not to go to work on the 1903 basis. Reports from the anthracite districts are that at Shamokin some work is being done by nonunion miners. At Scranton the Delaware & Hudson and the Erie companies are making preparations to resume as soon as possible, though generally work is suspended in the anthracite region. The bituminous mines that are to operate on the basis of the 1903 scale are expected soon to be running double shift.

Testimonial to Antimetric Writers.

A dinner was given by a number of machinery manufacturers at the Waldorf-Astoria, New York, on Saturday evening, March 31, 1906, at which F. A. Halsey, editor of the *American Machinist*, and Samuel S. Dale, editor of the *Textile World* of Boston, were guests of honor. In the campaign against the bill requiring the use of the metric system of weights and measures in connection with Government work these gentlemen have been most active in gathering data and marshaling argument against the compulsory adoption of the decimal system. The voluminous literature they have produced has been published in book form under the title "The Metric Fallacy" and distributed by the National Association of Manufacturers as part of the association's propaganda. In recognition of this work a number of manufacturers decided upon a testimonial to Messrs. Halsey and Dale, and a committee was formed to take charge of the movement. It consisted of Justus H. Schwacke of William Sellers & Co., Inc., Philadelphia; Henry Sharpe, Brown & Sharpe Mfg. Company, Providence, R. I.; William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio; H. N. Covell, Lidgerwood Mfg. Company, Brooklyn, N. Y., and Thomas E. Durban, Erie City Iron Works, Erie, Pa. The dinner of Saturday night was attended by a number of manufacturers and representatives of the technical press. Mr. Schwacke, who presided, presented each of the guests of honor, on behalf of those participating in the movement,

with a hall chime clock and in fitting words expressed the appreciation of those for whom he spoke. Responses were made by Messrs. Halsey and Dale and remarks were made by a number of the guests. George Moores, secretary of the British Association of Weights and Measures, told of features of the antimetric campaign in Great Britain, and Marshall Cushing, secretary of the National Association of Manufacturers, gave some account of the way in which the association had focused the antimetric sentiment of the manufacturers of the country on the congressional committee hearings at Washington. Regrets were sent by two members of the testimonial committee, Mr. Sharpe being in Europe, while Mr. Durban was absent because of illness.

The Passaic Steel Company.—The annual meeting of the Passaic Steel Company was held at the company's offices in Paterson, N. J., on Tuesday, April 3, 1906. The following Board of Directors was elected: W. A. Arnold, Thomas J. Arnold, O. W. Cooke, J. B. Cooke, A. H. Knapp, John R. Lee, F. C. Rinehardt, James Simpson, Joseph Wadsworth and Niven McConnell, all of Paterson; J. E. Childs, New York; Herman Osthaus, Scranton, Pa.; Theo. J. Wolfe, Scranton; H. S. Snyder, representing the Bethlehem Steel Corporation. The election of these directors carries with it an indorsement of the present management. The directors meet on Thursday, April 5, to elect officers.

The McCrory Wire & Nail Company has completed a new wire drawing and wire nail plant at Ellwood City, Pa. The works have 16 wire drawing blocks and 26 wire nail machines and an annual capacity of 2500 tons of No. 5 to No. 18 wire and about 60,000 kegs of wire nails from ¼ inch up to 6 inches. The company succeeds John McCrory, who formerly operated a wire drawing and wire nail plant at Allegheny City, Pa. This plant was dismantled in August, 1905, and the machinery removed to Ellwood City. John McCrory is president and manager, R. M. Jones vice-president and J. A. McCrory secretary and treasurer.

It is now stated that the settling of the estate of the chief owner of the blast furnace, rolling mills and foundry at Durango, Mexico, is the reason for the shutdown since September, 1905. The rumors of the purchase of this plant and the company's controlling interest in the Durango Iron Mountain by the United States Steel Corporation had no foundation in fact. Some American residents of Durango have just organized the Durango Foundry & Machine Company and will equip a new foundry and machine shop in a part of the city quite close to the Iron Mountain.

Negotiations are on for the purchase of the stock of Wade A. Taylor, president of the Empire Iron & Steel Company, Niles, Ohio, by John Warner, formerly of the American Sheet & Tin Plate Company, and William Ward. If the deal goes through Mr. Taylor will retire and Mr. Warner will likely become president. The company has a plant at Niles containing six hot mills and two cold mills, and makes high grade sheets.

In March the South Works of the Carnegie Steel Company, at South Sharon, Pa., surpassed all previous records for output. The blast furnaces made 47,965 gross tons of pig iron, the open hearth plants 54,977 tons of ingots and the blooming mill 57,352 tons of billets. Excellent records were also made at the Shenango Works of the same company at New Castle.

The Enterprise Boiler Company, whose plant at Youngstown, Ohio, was recently destroyed by fire, has leased the plant of the Girard Boiler & Mfg. Company, at Girard, Ohio, so that it will not be delayed in filling its contracts, but will rebuild its plant at Youngstown on a larger scale than before.

The Machinists' Union of Lynn, Mass., has made a demand for an eight-hour day and the closed shop, to be effective May 1. A strike is expected.

Labor Notes.

The annual conference between committees representing the Stove Founders' National Defense Association and the Iron Molders' Union of North America has been held in Chicago, the sessions beginning March 26. The contention of the molders that they were entitled to compensation for frequent losses on account of dull iron, which were precipitated by new cupolas or other agencies over which the molders had no control, was the basis of a change in the conference rules pertaining to this matter. The clause is now as follows: "When it is shown that the aggregate loss on account of dull iron amounts to 4 per cent. of the total value of the work poured by the molders in any one heat it shall be deemed a bad heat and payment shall be made for all work lost from this cause. When the aggregate loss from this cause is less than 4 per cent. of the total work in the shop and 10 per cent. or more of their day's work in the aggregate on account of dull iron, then the men shall be paid for all such loss in excess of 4 per cent. of their day's work, it being understood that where more than one cupola is used the molders receiving iron from each cupola shall be considered the same as though they were working in separate shops making the above computation. If sufficient is not furnished the molder to pour off his work, and such work has to remain over he shall be paid for such work remaining over at one-half the regular price. These rules shall apply excepting in case of breakdown of machinery or other unavoidable accidents, where no allowance shall be made."

A bill giving to the police authorities the power to license pickets during strikes has passed the House of Representatives of the Massachusetts Legislature. It provides that in case of a strike or lockout the chief of police, or in a town whoever holds similar power, shall ascertain the number out. It shall be lawful for these persons to elect by ballot representatives who shall be permitted to walk upon the public streets and ways in the vicinity of the place of employment, and in a peaceful manner converse with persons intending to go to such employer for work, in order to induce them not to work. The number of such pickets, legal representatives of the men who are out, shall not exceed one for every 20 or larger fraction of 20. Only one set of representatives shall be elected during one strike or lockout, but vacancies by death or disability can be filled. These representatives shall have credentials which the chief of police shall record and countersign.

The machinists employed in the union shops of Chicago have formulated demands for an increase of wages effective May 1. As most of the shops in the Chicago district are now open this notice will be served on relatively few employers and only a small number of machinists will be affected. The demands include increased wages for outside men employed on contracts from 50 cents an hour to a minimum wage of \$4.50 a day and an eight-hour instead of a nine-hour day; an increase for tool and die men from 37 cents an hour to a minimum of \$3.75 for an eight-hour day; a minimum wage of \$3 a day for machinists' helpers now making an average of \$2.75 for nine hours' work.

Some of the foundries in the Chicago district have already granted the demands made by the molders for increased wages, although the men employed at the foundry of the Fraser & Chalmers plant of the Allis-Chalmers Company and the Link-Belt Machinery Company are still on strike. The latter, however, is operating its foundry in full, having secured an ample number of nonunion operatives to take the places of the strikers who went out.

At a conference held last week with the Chicago boiler makers the employers flatly refused to grant their demands and the men are still at work, and there is little fear of a general strike.

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HARDWARE

THERE are certain lines of goods frequently and successfully handled by Hardware merchants which possess the advantage that instead of selling themselves they require effort to market them. Unlike the great bulk of the stock which is sold in the stores to persons who go there for the purpose of purchasing or who buy, attracted by the articles as they see them there displayed, the sale of the goods to which we refer requires the merchant to go out and canvass for business. This applies to such a line, for example, as Fencing, whether made of woven wire or of wrought or cast iron, both of these kinds being found by merchants a source of profitable business and entirely consistent with the sale of general Hardware of the more conventional lines. The very objection made by some merchants that the sale of this class of goods obliges them to leave their stores and solicit business, either in person or by some representative, is one of the strong arguments in favor of handling this line, because the successful marketing of it calls for active efforts, the adoption of new methods and the actual going out for orders. In this way the merchant is taken out of the ruts into which the conduct of his affairs is apt to drift, and a fresh and vigorous tone is not infrequently imparted to the whole establishment. Besides getting out of the ruts, which may be regarded as a negative benefit, the pursuing of this course results directly in an increase of business, in closer personal contact with those who are or who should be his customers, and in opportunities for securing orders for other lines of goods. But the recognition of the principle that customers are to be sought on their farms as well as welcomed at the store is, however, not the least of the advantages that attend the selling of such lines as imperatively call the merchant out of doors.

There are a good many indications that progressive retail merchants are considering carefully the question as to whether anything can be done to enable them to purchase goods at lower prices than at present, so as to put them in a position to compete with the catalogue houses. There is more and more a recognition of the fact that one radical difficulty in the present situation is the relatively high prices at which the retail houses purchase goods, so that they are at a disadvantage when they attempt to meet the quotations of the catalogue houses. The present costs of distribution between the manufacturer and the smaller merchants are under the existing system very heavy, hence the endeavor to find some short cut.

Syndicate buying on a larger or smaller scale has frequently been agitated, or some form of massing orders which will give the retailers the advantage of the low prices which are obtained by jobbers on account of their position as jobbers, or by the mail order houses, who, though they are retailers, purchase goods at least as favorably on account of the quantities they handle. There is, too, a constant effort being made by the larger or more enterprising retail merchants to do something of a jobbing business, so that in connection with the extension of their trade they may obtain a certain standing in the market as wholesale houses. In one important line a leading manufacturer has under advisement the desirability of making one price to all classes of trade, which would naturally result in the abandonment of the jobbing department of his business, relying principally on the selling of his goods to retail merchants at lower prices

than at present, but presumably in greater quantities. Some of the jobbing houses also, recognizing the difficulty of the retailers' position, have advocated the endeavor to aid them by sacrificing their jobbing profit on certain kinds of goods which in the regular course cannot be afforded by them at prices which would enable the merchants to hold their own in the competition they are forced to meet.

These facts are not recited as in any sense embodying a solution of the problem, but as indicating the recognition on the part of the manufacturers and the merchants, wholesale and retail, of the necessity that the prices to the retailers be brought down more nearly to the prices at which the catalogue houses buy. How this is to be accomplished remains to be determined. While this question is under consideration it remains, however, the prime wisdom for each retail merchant to see to it that he is a careful and close buyer, giving more attention to this department of his business than was the practice of many easy going Hardware merchants in days of less stringent competition.

Condition of Trade.

Trade is pursuing the even tenor of its way, and with the activity which prevails industrially and in connection with the cultivation of the soil a great volume of goods is constantly going into consumption, making a steady demand upon the distributors, the effect of which is felt in mill and factory. The fact that trade is without any specially new feature, but is running along in the regular and normal channels, is an evidence of the healthfulness of the situation, manufacturers and merchants generally being in a position to take care of business of more than usual volume under conditions which present no special difficulties in the way of unsettled markets or financial disturbance. Owning, too, to the fact to which we have before referred, that the larger merchants placed orders at an unusually early date for many lines of goods, there has not been during the past month as much buying as would otherwise have been the case, but there is now with the beginning of April something of a quickening in the demand, and manufacturers report the receipt of many orders, which are said to be not only from the large jobbers but also from the smaller houses, many of which do both jobbing and retailing, or even an exclusively retail business. The pressure upon the manufacturers is certainly all they care to have and many of them are seriously behind their orders, while practically all of them find their facilities fully taxed. The market's tone is in general steady, some slight indications of yielding, which were apparent a few weeks ago, having been succeeded by a firmer tone and a better feeling. Trade throughout the country has been interfered with somewhat by the comparatively severe weather which prevailed and the bad condition of the country roads in many sections. The so-called bad weather of March, so designated because of its interference with comfort, has unquestionably done a most beneficent work in the soil, laying what should be an excellent foundation for the crops. With the coming of spring the trade thus finds itself with very satisfactory conditions, having ample opportunities for individual enterprise and energy along lines which should be profitable.

Chicago.

The volume of business done by Western jobbers during March shows a comfortable increase over the corresponding month last year, but the totals are not as large as expected, the heavy buying early in the year having diverted many orders that otherwise would have been placed during this period. Retail merchants are not buying Nails and Wire products as freely as during the months of January and February, being chiefly concerned over the delivery of goods purchased at that time, and this no doubt will result in curtailing the tonnage requirements that will be placed by the large distributors this month. Reports that the Wire manufacturers have been accumulating stocks are denied, as their specifications are still in excess of shipments, and while the tonnage on their books is being rapidly reduced, no opportunity has yet been offered for stock accumulations. The movement of seasonable goods continues unprecedented, and the demand for Paints and Painters' materials on account of the large amount of building now under way in this section has never before been equaled. The advance in Strap and T-Hinges, in view of the recent advance of $7\frac{1}{2}$ per cent. and the previous demoralization of the trade, has occasioned some surprise, but no doubt can be charged to the increased demand from the building trade all over the country. Quotations on Copper goods continue to be well maintained, and with raw material on the present basis no concessions will be made. The contract for the Hardware for the new county building was awarded last week by the County Commissioners to the Yale & Towne Mfg. Company, Stamford, Conn. Collections continue exceptionally good, and the number of retail merchants that are discounting their bills is constantly increasing.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—We enjoyed beautiful weather in January and February. In March one snowstorm has followed another. This leads to the reflection that we are always liable to get what is coming to us. It is a law that we should have about so much winter; if we do not get it in one place we will get it in another. We had our winter a year ago in January and February; the weather in March was very much better. This year winter comes in March; we trust it will end with this month. These conditions remind me of the saying of a friend, "Climate we have all the time, weather only now and then."

Current business has been affected by the snowstorms—train service was delayed, mails came late, hauling was made difficult in the city and the country roads were impassable. The hand to mouth nature of local trade is clearly illustrated under such conditions. As the farmer in the snow and mud bound districts could not get to town the merchant quit buying goods.

Reports of winter wheat received from our salesmen are almost all of the most flattering character. Wheat generally is reported in very much better condition than at this period last year.

The country merchants of course are in close touch with crop conditions. They must realize that just as soon as the roads dry up and pleasant weather returns there will be an unusually heavy buying movement. Nevertheless, just because it is dull with them for the time being they have an attack of the blues. They should take advantage of the dull days to clean up their stores, rearrange their stocks and make up orders for the goods they are short. It would seem after the active business of January and February rather a quiet spell, as a result of the inclement weather in March, would be welcome to the retail merchants as an opportunity to get ready for the very heavy trade that is surely in store for them.

Jobbers, on the other hand, are glad to have a breathing spell after the strenuous business they have enjoyed since the opening of the year. It gives them an opportunity to catch up in their work; also to hurry forward belated cars of spring goods. It has become a custom with the trade in the West and South to purchase many lines in collective cars. When the season is unusually early merchants become nervous and somewhat excited

about the prompt delivery of these cars. Therefore recent weather is giving both manufacturers and jobbers a few extra days of grace in supplying these spring shipments.

Notwithstanding unfavorable weather conditions in March it proves to be a high record month in sales; it is the best month this house has ever enjoyed. It is only fair to say, however, that this result has been brought about by a large accumulation of what are known as "future orders," which were shipped and billed in March. Current business in a large portion of our territory was considerably affected by the weather. Many salesmen found it impossible to visit those parts of their routes off the railroads.

While sales on all lines of goods are increasing, sales on two lines are standing out in unusual prominence: One is that of Edge Tools, such as Hatchets, Hammers, Saws, Chisels, &c., and the other the very large sale of Builders' Hardware.

Judging from the correspondence of some dealers they seem to think special designs of Builders' Hardware can be obtained like chewing gum, out of a slot machine, and when they drop their letter in the slot and the Builders' Hardware does not come immediately we are threatened with the loss of their entire trade. Jes so! Jes so!

Now if the Weather Bureau will just give us plenty of sunshine through the month of April we believe there will be enough work for everybody.

It looks to-day as if we were to have a coal miners' strike. This will of course affect business in the mining districts.

When President Roosevelt took a hand in the settlement of the last strike the writer made a mental reservation that it would not be long before the miners would put it up to him again. Not only are they putting it up to him individually, but it seems it is being pretty strongly intimated to a number of politicians that if they wish to hold their jobs they had better "get busy."

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—There appears to be now a fair prospect of the weather settling down to spring form, which will promptly lead to active preparations for outdoor work of all kinds and afford an opportunity for the development of extensive local and country improvements for which plans have been made for some time. March business was handicapped somewhat by the very changeable and unpleasant condition of the weather. A copious supply of moisture throughout the corn belt region has placed the soil in admirable condition for the reception of seed grain, so that general conditions as they exist at present are considered very satisfactory.

A good volume of business is now being transacted. Evidences of prosperity are apparent on all sides and opportunities for profitable investments are steadily increasing. From now on a heavy demand for goods of all kinds is confidently expected.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Continued bad weather through the month of March, low temperatures, with snow, sleet and rain almost daily, have conspired to curtail business in the country. The bottomless road has again come to the top as a proposition, and swift current in the streams is relied on to wash off the wagon wheels. The farmers and fruit raisers have had several discouragements in the way of late frosts, so we are not just sure what proportion is left us of early vegetables and fruits, but we dare say there will be enough left to go around. Certain products have been extremely scarce this year. Apples have almost about doubled in price and are selling here at from \$6 to \$8 per barrel, but of course if we do not like that we can fall back on grape fruit and pineapples if we have the wherewithal.

The full price for cotton the past year has stimulated the planting of a large crop in Texas and the other cotton States, so that implements and utensils for cultivating the ground are in good demand.

In the cities all is activity. An immense amount of building and reconstruction is being done. The main

difficulty is to find men capable of doing good work and who take pride enough in their calling to bring about desirable results. Possibly it is just as well that the process is somewhat prolonged. If we could all rub Aladdin's Lamp and have our palaces or warehouses put up over night we should soon be overstocked with skyscrapers. There is much interest developing out here now in the concrete form of construction as opposed to the previous mill construction or even steel and brick, which has held prominence for so long.

There are a great variety of ways for reinforcing the concrete, all calling for more or less steel bars, twisted or notched or expanded in some shape so as to form a lock. It is inspiring to see the developments along this line, all rapid and with solid construction. We shall see vastly more of it in years to come as applied to bridges, culverts, tunnels, piers and in all sorts of large public works, as well as in the construction of smaller houses. The cement mills hereabouts have been making their preparations for this, and the rocks around Louisville have been largely exploited. Many nearby extensive plants have been greatly enlarged and several new ones erected, with a view of supplying the unlimited demand which is sure to follow the further adoption of concrete construction. It is working a revolution already.

Philadelphia.

SUPPLER HARDWARE COMPANY.—The friends of reform among the Hardware trade in this city—and that counts almost everybody—are congratulating the Mayor and his administration on having made good in the recent contest for the presidency of both Select and Common councils, which convened on the 2d inst. The reform or city party elected its candidates for these important offices by a good, clean working majority, which will enable the Mayor to carry forward the good work begun less than a year ago. Another rather unusual circumstance is the report of the treasurer, showing a surplus over last year of \$1,500,000. The reform movement is thus showing a tendency to stay reformed and to gain wisdom from past experience. The process of turning the rascals out is still in operation and there seems to be a determination on the part of the citizens to continue the good work indefinitely.

Business continues in very fair volume, except in locations where the menace of a coal strike results in cautious buying on the part of merchants. One of our officers has suggested that strikes would be less frequent and of very much shorter duration if it were understood that the officers shared with the miners in their loss of wages during the term of idleness, or if the miners and other operatives adopted a plan in vogue in certain foreign countries of paying the doctor a weekly stipend as long as he can keep them out of bed and able to earn a living.

Collections continue to reflect the good crops and general employment of our people all over the country and are better than a year ago.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—From the tone of some of the letters in a recent issue of *The Iron Age* it seems that business conditions in a number of the large Hardware centers are not quite as lively as they were 30 days ago. We shall have to differ from these gentlemen, as we have to report that the trade in this section continues to be rather remarkable. Speaking for our own company, we have never had such a business; the month of March broke all records in its history, both in point of sales and collections. April is starting off the same way and bids fair to be a very heavy month.

The movement of spring and summer goods is very large just at present and merchants are buying liberally of Poultry Netting, Fencing, Saddlery Goods, Refrigerators, Freezers, &c.

The Axe situation is rather confusing and interesting just at this time. The market seems to be somewhat demoralized and the smart retailers are taking advantage of the situation and placing liberal orders.

In this connection we have recently been much impressed with the wonderful progress that has been made by the retail dealers and country merchants of the South

during the last few years. They are making great strides and you will find them as progressive, alert and up to date as any set of men in the United States. Most of them have well arranged modern stores, equipped with the latest improved fixtures and methods for transacting business; they carry large, well assorted stocks and buy liberally though conservatively. The old custom of long terms and dating ahead is almost dying out, and merchants who formerly paid twice a year are now discounting their bills.

No other one class is doing more to improve and develop the South now than the present generation of retail merchants.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Business in the Pacific Northwest continues in the heavy volume heretofore reported. Clearings each week show that no section of the United States is expanding as much as the Pacific Coast. The efforts of railroads like the Chicago, Milwaukee & St. Paul to become transcontinental lines demonstrates what is thought of future prospects and business.

The Swift Packing Company of Chicago and Kansas City has completed the past week the purchase of 1600 acres on which to erect a packing plant that will be one of the leading plants of the country. The competition that will result from Swifts entering this field will be of great benefit to stock raisers in Oregon, Washington, Idaho and Montana.

The lumber business in Oregon and Washington has developed wonderfully in the past 18 months and is now done on a scale undreamed of a few years back. The world is our market.

Trade in hand is good and the prospect for the future is bright.

Cleveland.

THE W. BINGHAM COMPANY.—Activity among the Cleveland jobbers in all branches of the Hardware trade is very noticeable. Orders are coming in freely by mail and through salesmen for well assorted lines of goods. Customers are disposed to take our advice and are ordering in larger quantities than formerly. There is less "hand to mouth" business, showing that our friends appreciate the fact that well assorted stocks in good reasonable quantities on their shelves are what hold trade, for nothing is cheap at any price to the citizen or farmer that the storekeeper does not have in stock when the customer wants it.

All jobbers are experiencing difficulty in getting some goods from the factory, as the demand in some lines is very large indeed. We are, however, receiving goods in moderate quantities that were ordered three to six months ago in car lots, as the manufacturers are unable to carry out our wishes in this respect, and we are paying in some instances extra freight—that is, the difference between the carload and less than carload rates of freight—that we may get the goods in stock and serve our customers promptly.

We advise our friends if in want of Galvanized or Black Sheets to order from jobbers who have the goods in stock, for although they have had large, well assorted stocks of these goods on hand the stocks are running low and it is difficult for manufacturers to state any definite time as to when they will ship. We know of orders that were placed the middle of February for Galvanized Sheets on which the manufacturers will not promise shipment less than eight to ten weeks from date of entry. Don't depend too much upon the mill for shipment of these goods, but order from the jobbers who have these goods in stock and pay them the small difference—that is, the difference in freight from jobber's point of shipment and the mill. That is all the difference the jobber asks you to pay, and when the goods are shipped from stock you know when you will get them. The same is true of Merchant Pipe, Wire, Nails and many other heavy goods.

Skies are brightening, the sun is high in the heavens, spring is opening and everything looks encouraging for a good spring trade. We advise our friends and customers to look over their stocks and sort them up, especially on seasonable goods. Don't put it off, but be ready for the spring trade, which generally comes with a rush, and the

demand for some goods will be large—that is, Shovels, Spades, Garden Hoes, Rakes, Trowels, Manure Forks, Step Ladders and many other kindred goods. Lawn Mowers, Rubber and Cotton Hose will have their inning before many days.

There seems to be plenty of money in the country to buy things. Our salesmen report from different districts that farmers were never in such good shape. The best evidence of this is that one does not see "For Sale" bills hanging around the country stores.

All kinds of Agricultural Tools and Shelf Hardware, especially Builders' Hardware, are cheap. Never in the history of this country could one trim a house at so little expense or with as good quality of goods as to-day. Lock Sets can be bought at \$3 per dozen sets (that is, a mortise lock, long combination figured escutcheon, jet knob; front of lock, escutcheon, shank of knob, all Metropolitan bronze finish, put up in convenient shape), one set in a box, nicely papered ready to hand out to the customer over the counter. Just think of it, 25 cents per set, and it was not many years ago when a Lock Set not so good as this was jobbed at \$5 per dozen sets or 42 cents per set.

Why is there this amazing difference? Simply on account of the immense quantities turned out by the manufacturers, their knowledge of how to put these goods up in a marketable, convenient and desirable shape and their willingness to sell them at a moderate price. Our American Hardware manufacturers do not want it all—"just a little bit off of the top."

NOTES ON PRICES.

Wire Nails.—Specifications on contract orders are about equal to the productive capacity of the mills, so that stocks are not being accumulated. For some time past new business has been comparatively light, the trade having purchased earlier and in quantities to cover present requirements. Prices are firm and quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....	\$1.85
Carload lots to retail merchants.....	1.90

New York.—Demand for small lots from store is fair. Jobbers report that their sales for the three first months of the year were equal to the corresponding period last year. It is understood that jobbers' prices are being well maintained. Small lots from store are quoted on the basis of \$2.15 per keg.

Chicago.—The condition of the country roads in the West and Northwest has greatly interfered with the distribution of Wire products from retailers' stocks, and as a result they have only been purchasing sparingly from the jobbers during the past few weeks. Nevertheless, it is believed that dry weather for a period of a week or ten days will greatly relieve this situation, and as stocks generally are low buying will be renewed with increased vigor. The movement of Wire Nails during the present month promises to be exceedingly heavy, and specifications that are being daily received by the mills are practically on a par with shipments. Jobbers are beginning to place contracts for shipment during the next 60 days. The American Steel & Wire Company now has orders on its books for its goods that will insure the full operation of its mills until July 1, and with the new tonnage that will surely be received during the intervening period it is believed that the mills will operate in full during the summer months. The effects of the coal strike are already being discounted, as it is believed that it will be of short duration and will not materially interfere with either production or consumption. Quotations are unchanged, as follows: \$2 in car lots to jobbers and \$2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—While new demands for Wire Nails have been rather light for some time buyers continue to specify freely on contracts and shipments by the mills are large, preventing any accumulation of stocks. It is believed that the demand for Wire Nails in April will show material improvement over February and March. There

are no indications of any advance in prices, which are quite firm. We quote: Wire Nails, \$1.85 in carloads to the large jobbing trade and \$1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—Previous prices were reaffirmed by the Cut Nail Association at its meeting held last week. There is a fair demand, while specifications on contract orders are being liberally received by the mills. Quotations are as follows: \$1.80, base, for carload lots, f.o.b. Pittsburgh; \$1.85 for less than carloads, f.o.b. Pittsburgh; \$1.95 for carload lots, on dock, New York; \$2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—Local demand is about in the usual proportion to that for Wire Nails. There has been a scarcity of 3-penny fine Cut Nails in this market for two or three weeks. Manufacturers had apparently allowed their stocks to get low and find difficulty in keeping up with their orders. Jobbers' prices are being maintained and quotations are on the basis of \$2.05 per keg.

Chicago.—Inclement weather and the bad condition of country roads throughout the Middle West have put a slight quietus on the Cut Nail trade. The heavy demand during January, February and the early part of March, however, relieved retailers of their stocks, and the present month is expected to be bigger than any previous April in the history of the trade. Quotations are firmly maintained as follows: Steel Cut Nails in car lots, \$1.95; less than car lots, \$2; Iron Cut Nails, \$2.05 in car lots; less than car lots, \$2.10.

Pittsburgh.—At the meeting of the Cut Nail Association, held last week, no change was made in prices. We note a fair demand for Cut Nails, which is expected to show betterment this month. Buyers are specifying fairly liberally on contracts. We quote \$1.80, base, for carload lots, f.o.b. Pittsburgh; \$1.85 for less than carloads, f.o.b. Pittsburgh. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

Barb Wire.—There is little new business being received by the mills, as large contracts were placed some time ago. Specifications are heavy, and in some cases deliveries are being anticipated. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.00	\$2.30
Retailers, carload lots.....	2.05	2.35
Retailers, less than carload lots.....	2.15	2.45

Chicago.—Stocks in both the hands of retailers and jobbers are light, and the mills continue in receipt of heavy specifications. Little new tonnage is being booked, which is natural at this season of the year, inasmuch as most of the contracts for this material were placed three or four months ago. Quotations are unchanged, as follows: To jobbers, Chicago, car lots, Painted, \$2.15; Galvanized, \$2.45. To retailers, car lots, Painted, \$2.20; Galvanized, \$2.50. Retailers, less than car lots, Painted, \$2.30; Galvanized, \$2.60. Staples, Bright, in car lots to jobbers, \$2.10; Galvanized, \$2.40; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New demand is light but shipments by the mills on contracts are fairly heavy. Stocks carried by the mills are light, and on some sizes buyers are anticipating deliveries. Prices are firm but without change, as follows: Painted Barb Wire, \$2, and Galvanized, \$2.30, in carload lots to the large jobbing trade, with the usual advance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Orders for shipments on contracts comprise the bulk of business received by the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.70
Retailers, carloads.....	1.75

The foregoing prices are for base numbers, 6 to 9.

The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago.—Heavy contracts are being received from telephone interests throughout the country, and the consumption this season promises to be bigger than ever before. Bale Ties also continue to move freely, and the specifications from Fence manufacturers show no falling off whatever. Quotations are unchanged as follows: To jobbers, \$1.85, f.o.b. Chicago, in car lots, and car lots to retailers, \$1.90.

Pittsburgh.—New demand is only fair, but specifications are being received by the mills in good volume and shipments by the mills are heavy. It is expected that tonnage in Smooth Wire this year will much exceed all former records. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Jobbers, carloads.....\$1.70
Retailers, carloads.....1.75

The above prices are for base numbers, 6 to 9.

Paris Green.—Manufacturers have not yet announced prices for the season, although it has been more or less generally understood that they would do so about April 1. It is now thought that prices will be given out about the middle of this month and that there will be considerable uniformity in the prices of different manufacturers. Importations of Arsenic are being received by manufacturers in comparatively small lots. Manufacturers are booking memorandum or price-less orders for Paris Green for future delivery, to be billed at the prices ruling at the time of shipment.

Conductor Pipe and Eaves Trough.—Following are the new discounts recommended on 14, 16 and 20 ounce Copper Conductor Pipe and Eaves Trough, as referred to in last week's issue: Eastern territory, 40 and 10 per cent.; Central territory, 40 and 7½ per cent.; Western and Southern territory, 40 and 5 per cent.; Southwestern territory, 40 and 2½ per cent.

Rope.—Market conditions remain unchanged, with a fairly good demand and unchanged quotations. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality, 8 cents per pound.

Window Glass.—The meeting of the Window Glass manufacturers held last Thursday was well attended, 1819 pots being represented. An advance in prices, effective at once, is reported to have been made as follows: 90 and 2½ per cent. discount for all single, and 90 and 7½ per cent. discount for all double, excepting Greenhouse and Picture Glass, on which a price of 90 per cent. discount was made to all buyers of 1000 boxes or less. To buyers of more than 1000 box lots discounts were made of 90 and 5 per cent for all single and 90 and 10 for all double, Greenhouse and Picture sizes excepted, these prices to hold good until April 19, when a further advance is contemplated. It is understood that a majority of the manufacturers at the meeting were in favor of the advances. The American Window Glass Company is reported as having advanced its price to 90 and 5 per cent. discount. Local jobbers have made no change in prices, having decided to wait until after a meeting, which is to be held this week, to consider the matter. New York quotations are now 90 and 10 and 5 per cent. discount for all sizes of single and double strength. Demand at this point shows some improvement.

White Lead in Oil.—Improved weather conditions have stimulated demand to some extent. This is shown by orders from merchants, which indicate that they are anticipating an increased demand. Deliveries on contract orders have been in good volume. Quotations are as follows: In lots of 500 pounds or over, 7¼ cents; in lots of less than 500 pounds, 7½ cents per pound.

Linseed Oil.—Demand is light and the tendency of the market is toward weakness. Large quantities of Oil were contracted for early in the season, in the neighborhood of 35 cents per gallon, many of these contracts expiring about the middle of May. Not much improvement in market conditions is looked for much before that

time. City Raw is quoted at 42 to 43 cents per gallon. Out of town Raw is held at 39 to 40 cents for any quantity, with deliveries on contract orders extending to August 1. Boiled Oil is 1 to 2 cents advance over Raw.

Spirits Turpentine.—For the week under review prices have fallen off about 1 cent per gallon. Demand has been light and for small lots. While the stocks at Savannah are comparatively small the near approach of the new crop will possibly act as a restraining influence to a permanent advance in prices. New York quotations are as follows, according to quantity: Oil Barrels, 69½ to 70 cents; Machine Made Barrels, 70 to 70½ cents per gallon.

CALIFORNIA STATE RETAIL HARDWARE ASSOCIATION.

AT the recent annual meeting of the California State Retail Hardware Association, held in San Francisco, the following officers were elected for the ensuing year: C. M. Brown, Hollister, president; Geo. H. Smith, Oakland, first vice-president; W. E. Devore, Ocean Park, second vice-president; Frank B. Dickson, Rialto Building, San Francisco, secretary, and Geo. M. Hickman, San Francisco, treasurer. The Executive Committee comprises the president, vice-presidents and secretary and the following representatives (two for each) of the different sectional associations embraced in the membership: Frank Ladd and F. Rittigstein, Oakland, Alameda association; L. E. Ladd, Hollister, and S. Coiner, Santa Maria, Central association; J. C. Maller, Santa Rosa, and J. H. Steves, St. Helena, North Coast association; H. C. Bennett and I. C. Walker, San Francisco, San Francisco association; G. H. Glassford, Fresno, and D. C. Wood, Modesto, San Joaquin association; H. Guyot, Los Angeles, and C. B. Pettis, Ocean Park, Southern association; W. J. Boschkin and H. C. Holmes, San Jose, San Jose association; Oscar Schulz, Dixon, and John C. White, Marysville, Pacific association; F. J. Reed and H. H. Buhne, Eureka, Humboldt association. Much of the success achieved by the State organization has been secured through the establishment and development of the sectional bodies, and in this respect its work is conducted on different lines from those of other State associations. The association has had a marked growth during the past year, both in membership and influence, and the new officials may be counted on to still further enhance its efficiency and usefulness.

COES WRENCH COMPANY'S CATALOGUE.

AN attractive and useful catalogue is being placed in the hands of the trade by the Coes Wrench Company, Worcester, Mass., who are represented by J. C. McCarty & Co., 10 Warren street, New York, and John H. Graham & Co., 113 Chambers street, New York. Attention is called to the foundation of the business in 1843, and views of the present plant are given, together with a portrait of Loring Coes, the original inventor of the screw wrench. The catalogue is exceptionally complete, showing five varieties of Wrenches which are listed in 48 sizes. It also contains much helpful information in a convenient tabulated form, such as case weights and measurements which are particularly useful for the foreign trade. An addition to the well-known Coes line is the Key Model Wrench, which was designed to fill the gap between the 21-inch and the heavy Spanner Wrench for large work. It is made of heavy steel forgings, fully hardened by a special process and is subjected to a severe test before shipment to insure freedom from flaws. The catalogue also lists a new 48-inch Wrench which takes a 9-inch hexagon nut. It is 48 inches over all, weighs 62 pounds and has two positions for strap.

As we go to press we learn of the death of Frank Chandler, of Chandler & Farquhar Company, Boston, Mass., on Wednesday morning, 4th inst. Mr. Chandler was long and prominently identified with the trade. The funeral services will be held on Sunday.

Correspondence.

Four-Day Hardware Conventions.

To the Editor: On page 925 of your March 8 issue you quote me as suggesting a four-day session for conventions in the future. Your quotation is correct as far as it goes, but the essential features that I mentioned in suggesting this change are not stated.

In the first place, I believe that a four-day session could be made a success, but my suggestion was that the forenoon of each day be devoted entirely to the meetings and business of the association, and that no exhibitor or manufacturer be allowed to open up his exhibit until 12 o'clock at noon.

Open the exhibits at noon and devote the entire afternoon to them, with no meetings of the association, and close the exhibits at 7 o'clock and let the evening be devoted entirely to entertainment.

A GOOD THING.

We all realize that the meetings of the Hardware dealers are a good thing. We realize that the gatherings of the dealers and manufacturers once a year bring them in closer relation to each other, and by meeting with their fellow tradesmen and the manufacturers the dealers get ideas that certainly help them in a business way.

We believe in helping the associations to make a success of their meetings, but to make a success at the present time with the meetings as largely attended as they are, some system that will be beneficial to both the association and the manufacturer must be adopted, and I believe that the above proposition is the most feasible and will prove the most satisfactory to all parties concerned.

IT WILL GIVE THE DEALER

the entire forenoon of each day to attend the meeting without being corralled at every step by a salesman. It will give the manufacturer the entire afternoon to exhibit his wares without feeling that he is intruding on the rights of the association by keeping the members away from their meetings, and by closing all exhibits at 7 o'clock it will give the manufacturer a chance to spend his money and entertain his customers and friends during the evening.

WHITE LILY WASHER COMPANY,
SAM T. WHITE,
Secretary and Treasurer.

IMPORTANT HARDWARE TRIM CONTRACT.

YALE & TOWNE MFG. COMPANY, 9-15 Murray street, New York, has just contracted to supply the Hardware trim, consisting of Locks, Knobs, Escutcheons, Window Fixtures and analogous Builders' Hardware, for the Cook County Court House, Chicago, all of which will be made to special designs from the architects' drawings. This is believed to be the largest contract in money value ever given for Interior Hardware trim, aggregating about \$32,000. The architects are Holabird & Roche, Chicago.

THE special feature of the April catalogue of Butler Brothers, Chicago, wholesalers of general merchandise, is a sale of Glassware, Crockery and China at prices which are referred to as exceptionally attractive. The covers, as usual, contain many hints and suggestions of value to retail merchants in the conduct of business.

AMERICAN FORK & HOE COMPANY, Cleveland, Ohio, refers to the substantial favor which the Warren Hoe made by the company has met at the hands of the trade. The unique shape of this Hoe enables the operator to furrow a row with the point, and after the seeds have been dropped to cover up the furrow with the winged tips simply by drawing it along. The Hoe is highly polished, with bronze gold finish.

HENRY M. GAY, who has sold Hardware on the road for the past 37 years and the last three years for Wells & Nellegar Company, Chicago, has recently connected himself with the Philip Gross Hardware Company, Milwaukee, Wis. His future duties will enable him to take a well earned rest from the exacting work of modern commercial traveling.

TRADE WINNING METHODS

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

WASHINGTON HARDWARE.

THE celebration of Washington's Birthday is a matter of unusual interest to the officers and employees of the Gray & Dudley Hardware Company, Nashville, Tenn., Washington being the company's trademark and used upon its leading goods. Some years ago the company inaugurated the Washington Birthday "sales celebration," in connection with which prizes were offered to the salesman mailing the greatest amount of orders for Washington brand goods on the 22d of February. A prize was also given to the customer mailing direct or through salesmen the largest order for Washington lines on that day.

This year the success of the sale proved a surprise to every one connected with the company. Orders for Washington brand goods mailed on February 22 aggregated nearly the amount usually received for a period of 60 days, although this brand has always proved popular with the company's trade.

During the 30 days prior to the birthday the salesmen of the house decorated their buying friends with Washington buttons, while Washington stickers by the thousands were used in labeling everything in the Southern country. A few weeks previously the company began sending out with every box or package shipped a poster slip printed in startling red ink, in which customers were invited to "celebrate with us."

An attractively printed circular, headed "The Minute Men of '06," was issued, in which a list of Washington brand goods was given, together with the number of the pages of the company's large catalogue on which the various articles were shown. This brand is applied to an extensive line, including Nail Hammers, Chisels, Files and Rasps, Steel Goods, Horse Nails, Rubber Belting, Garden Hose, Scales, Pocket Knives, Carvers, Table Cutlery, Shotguns, &c. "Washington Hardware quality will live," the circular remarked, "as the name of the Father of Our Country—always."

The prize this year for the merchant sending in the best order for Washington goods was a handsome double-barreled Shotgun.

HARDWARE MERCHANTS' MONTHLY BULLETIN.

J. M. DAVIS & SONS, Oakland, Md., with January began the publication of a monthly bulletin in the interest of their business. It is styled *The Hardware Bulletin*, and 1000 copies are mailed to a selected list of persons in the firm's territory on the first of each month. The purpose of the publication is not only to advertise the large variety of goods carried by the house, but also to combat the competition of the catalogue houses. The firm believes that by carrying a complete and up to date stock of goods and bringing the fact home to the public in this way a large proportion of the trade can be retained by the local merchant. It is found that many people inclined to buy at a distance through the mails are willing to give the local merchant the preference, if given assurance that they can do as well.

The Messrs. Davis refer to the experiment as a somewhat expensive one, but believe the returns have more than justified it. Quite a number of their farmer customers have called to express their thanks for the bulletins sent them and their appreciation of the interest and enterprise thus shown. The expense of getting out the bulletins has been diminished, too, with a little help from the manufacturers on lines bought direct and by the publication of a few advertisements from merchants

in other fields who are also feeling the effect of competition from the mail order concerns.

The January and February issues contained 16 pages, while that for March was eight pages larger. The front cover presents a view of the firm's two-story building. A feature of the February issue was an interesting article by the senior member of the firm, entitled "Looking Backward and Forward," in which Mr. Davis contributed some thoughts from his 40 years' experience in business. Under the same title in the March number Mr. Davis discussed the banking business as conducted 50 years since and contrasted with present methods.

In forthcoming issues it is planned to have special articles which will interest and entertain the farming community generally. The scope of the paper will be broadened, and doubtless its size enlarged as circumstances warrant, and every effort will be made to maintain and increase the interest thus far aroused.

In each number on the inside of front cover is a summary of "Things to Be Remembered," from which we make the following extracts:

We spare neither time nor money to care for our customers' wants. We are constantly endeavoring to please every one, so that our chain of friends may increase and that they will use their influence in our behalf among their friends and neighbors.

We try to describe each and every article as it is, as we want every one to understand the quality and kind of goods we offer to sell them.

We will try to keep a line of repairs for all the goods we sell. Great loss is often experienced when repairs cannot be had at short notice.

Any one contemplating building a house or barn or making general improvements will do well to see us and get prices, as we are prepared to give correct figures upon which to estimate.

We can mail a manufacturer's catalogue of any particular article we represent to any person desiring to investigate with a view of purchasing.

Come and see us whether you buy or not. Examine goods and prices. Thirty minutes spent in this way will do more than any amount of talk to convince you that we mean what we say.

Goods should be bought early, as all good articles are scarce during the season they are used.

The firm suggests that it would be glad to exchange with other retail Hardwaremen who are publishing bulletins and papers in the interest of their stores; it is believed that such an exchange could not help being of mutual benefit.

TRADE ITEMS.

THE business of Wilcox, Crittenden & Co., Middletown, Conn., manufacturer of Marine Hardware, has been incorporated in Connecticut with an authorized capital stock of \$300,000, of which \$250,000 has been subscribed. The officers, who are also the incorporators, are: President, Albert R. Crittenden; vice-president and general manager, William W. Wilcox; secretary and treasurer, H. C. Whittlesey; assistant secretary and assistant treasurer, H. C. Holmes. There will be no change either in the management or in the line of business.

THE BOSTON WOVEN HOSE & RUBBER COMPANY, Cambridge, Mass., manufacturer of Rubber Specialties, has been incorporated in Massachusetts with a capital stock of \$1,200,000. The officers are: President, J. N. Smith; treasurer, H. B. Sprague; clerk, J. Q. Bennett; directors, these officers and W. A. Bullard, H. L. Burrage, B. F. Spinney and M. F. Smith. Alexander M. Paul is the general manager of the business.

MARTIN SKATE COMPANY, Boston, Mass., is moving into new and permanent quarters in a four-story factory building located at 208-212 Camden street, Boston.

F. H. KYTE, Pittston, Pa., for the past 23 years manager of the Hardware store of S. P. Fenn, who has recently retired, has embarked in business on his own account under the style of the Pittston Mercantile Company. Mr. Fenn will carry on principally a commission business, acting as selling agent for manufacturers. On April 1 he will open a store in Pittston, handling a stock of Builders' Hardware in connection with other lines.

THOMAS A. ALEXANDER, who since November, 1895, has been in the employ of the Yale & Towne Mfg. Company, has recently associated himself with the Peck, Stow & Wilcox Company at its branch, No. 27 Murray street, New York.

IN connection with the convention held by the engineers of maintenance of way in Chicago, March 20-22,

Hubbard & Co., Pittsburgh, Pa., issued an interesting booklet entitled "From Forge to Finish," in which attention was called to their line of railway tools, including Track Shovels, Locomotive Scoops, Tamping and Clay Picks, Double End Track Wrenches, Spike Mauls, Claw Bars, Track Chisels and Rail Tongs. A few of the operations through which these tools pass in the process of manufacture were illustrated.

MERCHANT & EVANS COMPANY, Philadelphia, manufacturer and jobber of Bright and Roofing Tin Plates, Black and Galvanized Sheets, Metals, Tubing, &c., is distributing among its friends and patrons a neat perpetual calendar of pocket size. The directions for using are easily understood and the index runs from 1776 to 1955.

SCHOVERLING & WELLES, formerly at 2 Murray street, New York, handling various kinds of sporting goods, such as Guns, Ammunition, Fishing Tackle and Kindred Outing Supplies, have just moved to 6 Reade street, near Centre street.

THE SMITH & HEMENWAY COMPANY, now at 296 Broadway, New York, in order to obtain more room and increased facilities for conducting its business, will on or about May 1 move to 108-110 Duane street, around the corner from the present location. Here the company has leased the entire first floor, one flight up, in which there is nearly three times the floor space of the present quarters.

FIRE on the 22nd ult. partly destroyed the general Hardware stock of F. M. Smith & Co., Fort Wayne, Ind. Their collection of catalogues and other trade literature was also consumed, and they will value copies of the latest catalogues and price-lists from those from whom they buy goods. The firm will continue business at the old stand.

KEEPING TRACK OF EMPLOYEES' TIME.

THE AMERICAN RAILWAY SUPPLY COMPANY, 24 Park place, New York, which has been making brass time checks for more than 30 years, has recently issued an interesting pamphlet, entitled "Time Checks and Their Use," in which an easy and practical method of accurately keeping the time of factory and similar employees whose wage is computed on the basis of number of hours worked is described. The method described is employed in a prominent iron plant and is as follows: Duplicate check boards are used, with pins projecting $\frac{1}{4}$ inch. Under each pin the number corresponding with the check to be hung there is marked. Duplicate boards are used, and one can be arranged during the day for use the next morning, so that an employee will not have to remain to arrange the checks turned in in the evening. Every man calls at the timekeeper's window for his check before going into the foundry. At 7 o'clock the doors are closed, and any one coming later must pass through the office. Each department also has a board to hang the checks on during the day, so that the foreman of department can always tell how many men are at work. At quitting time, no matter when, the men take the checks and report at the timekeeper's office the number of hours worked. The checks are then dropped into a drawer through slots, which has compartments arranged from 5 to 15, running in halves, and the checks are dropped into the compartments corresponding with the number of hours worked. The time book is kept by number as well as name, the man's number preceding the name and running in consecutive order. In the morning a clerk takes the drawer with its various compartments and credits each man with the number of hours worked, according to the department from which his check is taken. This method of recording employees' time is said to require very much less time than by the clock system. Provision is made for checking names either before or after 7 o'clock, so that the management knows exactly the number of hours worked and is able to detect errors if the correct time is not given.

Mays & Crowe, The Dalles, Ore., have sold their Hardware, Stove, Implement, Plumbing, Heating and Sporting Goods business to Sexton-Walters Hardware Company.

FACTORY COST AND BUSINESS METHODS.

A FACTORY COST SYSTEM.

BY R. W. M'DOWELL.
(Concluded.)

This article was begun in our last issue and is concluded below. It describes a system for keeping track of factory costs which is in use by a machine tool manufacturing company. In last week's issue the stock order signed by manager, the department order signed by factory clerk, the work ticket and the requisition order for material were illustrated and described. The requisition order called for 100 Rough Gear Wheel Castings and 100 Set Screws.

When the stockkeeper delivers this material he reports to the office, using a blank like Fig. 6, giving the order and requisition number as well as the amount and

STOREKEEPER'S REPORT.						
D to 8/24/05		Requisition 1108		Order No. 547		
Amount	Material	These Columns for Office Use Only				
		Price	Raw Matl	Castings	Mfd. Part	
100	less 1 lb Castings 158 lb				51	
100	let 1 lb 158 lb	024				4.8

L. Mahoney
Storekeeper

Fig. 6.—Storekeeper's Report.

kind of material delivered. The columns at the right hand side of the blank are for the use of the office, and are filled in, showing the value of the material used on the job. If many requisitions are made out daily, the form may be altered slightly by providing a column for order and requisition number, and entering all the requisitions of the day on the one blank. This plan is recommended where a large amount of material is used daily, but otherwise the plan illustrated is the best, as it is much easier in making up the costs to have a separate form for each job. From these reports the

Stock Record.

Fig. 7, is also compiled, this being a 4 x 6 inch index card, giving the amount of material received or made, the amount used and the balance. If it is desirable to provide more information than is shown on the card, a loose sheet may be used instead, thus giving space for any desired data or information, but cards are preferable from the ease with which they can be adapted to indexing and filing so as to be readily accessible. The material having been delivered, the foreman sets as many men as he thinks necessary to work on the job, first issuing to each

A Time Card

as shown in Fig. 8. This card is designed for use with a time recorder, as shown in the illustration, but it could

be simply filled in with a pencil by a slight alteration of the form. This plan is not recommended, however, as the time on most jobs will be simply guess work unless a time recorder of some description is used. The writer knows this to be a fact from some years of the most painful experience. The machine which makes out the card shown not only records the time of beginning the work, but also the elapsed time, thus saving an immense amount of clerical labor and avoiding many mistakes.

Other Departments.

As soon as the work has gone on as far as it can go in this department the foreman notes on the work ticket the date, number of pieces and the department to which they were delivered. The foreman of this department signs his name in the proper space, thus receipting for the material, and proceeds with the work in the same manner as the first department, issuing cards for each man on the job. As soon as a department has completed its part of the work the foreman O. K.'s his order copy, which, together with all time cards, other order copies, &c., is collected by the factory clerk daily and turned in to the office. The office copy of the order is in the form of

An Envelope

a trifle larger than the other order copies, and as it will be noted from the forms shown that all with the exception of the cost sheet are the same size, all order copies, time cards, requisitions, &c., connected with each job can be filed in the envelope bearing the job number, thus putting them in the best of shape for making up the cost sheet. These envelopes are filed in a drawer fitted with a numerical index. By this method there need be no special pigeon holes for the collection of these papers, nor is there one-half the danger of losing or mislaying them.

When the job is completed the work ticket and all time cards, orders, &c., are turned over to the factory

[illegible]

Fig. 7.—Stock Record.

clerk, who notes the time and date of the completion of the order on his copy of it and turns the entire lot of papers in to the office. These papers are placed in the envelope of their particular job number, and all data is then at hand for making up

The Cost Sheet

shown in Fig. 9. This sheet is much larger than the other forms, so that plenty of space is provided for giving full information about the job and taking care of cases where

there is a long list of operations. It is necessary to have every particular regarding the cost of the various materials and the labor on the different operations plainly shown up on this sheet, as it is here that comparisons with former or future jobs must be made, in order that it may be immediately noticed if any part of the work is

from the Stockkeeper's Report described above, and shows that there were 156 pounds of castings used, costing \$3.51, and 100 Set Screws costing 43 cents, making a total cost for material of \$3.94. On the other side of the sheet the operations are taken from the time cards and show a total productive labor item of \$11.04.

TIME CARD						MACHINE SHOP DEPT.	
FORM NO. 1-20-B						Date	
						8/29/06	
TIME EMPLOYED 3 37 COMMENCED						Clock No. 6	
Boring	Drilling	Grinding	Planing	Tapping	P. W.	D. W.	
Chipping	Facing	Milling	Roughing	Threading			
Cutting Off	Filing	Mounting	Shaping	Turning	Pieces		
<i>P. Sady 114</i>						Rate 30	
Verified by <i>E. Snyder</i> S. O. 667 O. O.						Amount 1.09	

Fig. 8.—Workman's Time Card.

costing too much, or if any department shows too much of an increase in its expenses. By carefully

Comparing the Cost Sheets

for similar articles made in the past the management is put in possession of accurate data to guide them in locating any leak or to aid them in reducing their costs. The

This Should Not Be Neglected
nor should it be deemed sufficient to calculate this at the outset and keep as this is an item that will constantly change. It is here that many cost systems, efficient and carefully planned in other respects, fall far short of what is required of them by failing to correctly provide for this item. In the present case this percentage is 66 per cent., making the shop burden on this particular

COST SHEET								
Cost of <i>100 Set Screws</i> , manufactured on Order No. _____, Job No. <i>567</i>								
Material	Lbs.	Price	Amount	Operations	Nos.	Hrs.	@	Total
Castings	156	24	3.51	Milling	12	45	40	1.70
Brass				Facing	11	55	50	1.09
Forgings				Drilling & Boreing	16	20	30	6.38
Wrought Iron				Turning	291	7.50	25	1.87
Machine Steel								
Shafting								
Tool Steel								
Key Steel								
Nuts and Bolts								
Steel Castings								
Pulleys								
Special Patterns								
Misc. Materials								
<i>Set Screws 100</i>			43					
Sundries								
Total								
Special Items of expense not mentioned above. List separately below.								
Total			3.94					
Remarks:—								
Total Productive Labor					56	58		11.04
Add % Shop Burden					66%			7.28
Add Material, etc.								3.94
Special								
Total Cost of Order								22.26
Cost Each								22

Fig. 9.—Cost Sheet.

left hand side of the sheet is devoted to a list of the materials ordinarily used in the manufacture of the product, with ample space for any special materials on any job. The right hand side is used for a list of the operations on the job, as shown by the time cards, space being provided at the lower part of this section for summing up the items of expense which enter into the job. In the illustration the "Material" side of the sheet is filled in

job amount to \$7.28. The cost of the material is then brought over and added in, making the total cost of the order \$22.26. The sheet is then filed in the order of the job number, the envelope, with all papers, cards, &c., relating to the order still inclosed being filed in a drawer either in the order of job number or under the name of article, as most convenient, and everything is then in shape to figure up the costs on the next order.

By this system it is possible to

Locate Any Leaks.

in the cost of manufacture, either in material, through waste or other causes, or, as is far more likely to happen, in the time consumed on the various operations. If the next order of gear wheels should cost much more than this one, the cost sheet would be gone over to see why. If necessary the original papers used in compiling both orders could be obtained from the envelopes, and the time cards, &c. gone over. The reason would then be easily found. It might be that a \$3.50 man was being worked on a part of the work that a \$2.00 man could as easily perform, or it might show, for instance, that employee No. 245 required 26 hours in drilling and threading, while No. 16 consumed but 21 hours 16 minutes. This could be obtained from the cost sheet and the envelopes would still hold the original time cards, which would be valuable in case of a dispute of any kind. It will be seen from the above description that there is little expense connected with the operation of this system and that the foremen have but little clerical labor, and for this reason it is thought that there should be little objection to it from those who object to cost systems on those grounds.

FISHING TACKLE IN THE HARDWARE STORE.

BY HAMMERNAIL.

WITH profits on staple Hardware constantly being cut down and general store expenses continually increasing, the wise Hardwaremen are those who are adding to their business such lines of merchandise as will sell, and sell at a good profit. Such a line is Fishing Tackle. During the past three or four years many Hardwaremen have taken up the sale of this line, and all such are united in the opinion that it is one of the best side lines procurable. When the subject is seriously considered it is difficult to find a good reason why the Hardware store has not always been the store where the fisherman could have his wants supplied. For some years, in many parts of the country, the drug and fancy goods trade about evenly divided this business with the stationery stores. The line may have appealed to the druggist because of the large profits—100 Fish Hooks costing from 5 to 10 cents sell for from 5 to 10 cents a dozen. And the Hardwareman may have feared the details of the Fishing Tackle trade, but any man who has been able to learn and successfully handle such a complicated stock as Hardware will find Fishing Tackle simple and easy.

THERE IS NO BETTER TIME

than the present to put in a stock of Tackle. As a general thing the largest sales are in late spring or summer and the business begins just as soon as spring comes. Throughout the entire United States the year 1905 was the biggest ever known in Fishing Tackle, the sport is gaining popularity each season, and unlike many outdoor sports is not a fad. It's a rare thing for a fisherman to tire of fishing; it's not confined to any class or any age. The gray-haired clubman of the city looks with as much eagerness to the coming of spring, when he can take his tackle and spend a few days on river or lake, as did the country boy 50 years ago long for the days of May, when with bare feet he could wade down the stream a-fishing. And each year many new members are being initiated into the fraternity of fishermen. And a person who once becomes an enthusiastic fisherman never seems to lose fondness for the sport. It's not the number of fish one gets, it's the going after them that gives the pleasure. It is evident that the business is as permanent as it is profitable.

IN MANY PARTS OF THE COUNTRY,

even in spite of the increased number of fishermen, the chances of "good luck" are constantly becoming better. The Federal and the various State governments are doing much in this matter by enforcing more rigid game laws; by protecting the streams and lakes from pollution, and each year by planting hundreds of millions of game fish hatched in an artificial way. And the business of supplying the fisherman belongs just as truly to the Hardware dealer as does that of supplying the carpenter or the builder.

IN PUTTING IN A LINE

of Fishing Tackle the same care should be taken in getting goods suited to the store's trade or to local conditions as in any other line of merchandise. Tackle is one of the easiest lines in which to overstock. Like all seasonable goods, it is best fresh and new. But on the other hand the assortment must be large enough to make a favorable impression. It is well to remember that much in Fishing Tackle is sold because the fisherman may take a fancy to it—not because he actually needs the goods. It is surprising to see with what a small outfit it is possible to get a good catch of fish, and just as surprising, at least to the uninitiated, to find how many outfits an enthusiast may have. These are facts that are well worth remembering, and the dealer who acts in accord with them will find his trade growing and his store becoming still more the center of the Fishing Tackle business.

A MERCHANT'S EXPERIENCE.

Referring to the sale of Fishing Tackle, which was stocked for the first time in 1905, I heard a Hardwareman thus express himself the other day: "Do you know for more than ten years I've been thinking about adding this line, but there have always been some two or three other stores carrying a pretty good stock here in my town, and I felt that there would not be business enough to warrant another stock. However, last year I bought a little line, first order amounting to about \$185. I put on a good stiff profit, but did some advertising and made an attractive show of the goods. I sold completely out on a number of things, and the stock was so well sorted that it sold down pretty evenly. The concern who made up the order for me used such good judgment that the business was most satisfactory.

"But," continued the merchant, "the point I am making is this: That my entering the field seemed to make no difference in the volume of trade done by the other dealers in Fishing Tackle, and it would seem to be true that the more dealers handling this line, the more Tackle goods will be sold. It certainly is true that Fishing Tackle is a line that sells in much the same proportion to the manner in which it is displayed, always starting with the fundamental principle that there is some demand in the locality for the goods."

Of course, in the case of this merchant, no small amount of energy was put into the business. But it was profitable and his is not a large store nor especially well located in his city. Fishing Tackle is one of those lines that will help the Hardware dealer when he has to sell some things on a 10 or 20 per cent. margin. A few hundred dollars of cash business on a 100 per cent. basis of profit is better than some thousands on a 10 per cent. profit.

UNION HARDWARE & METAL COMPANY'S NEW WAREHOUSE.

UNION HARDWARE & METAL COMPANY, Los Angeles, Cal., has lately taken possession of its new and commodious warehouse, which is situated on a block containing 235 x 900 feet, of which the new building occupies 235 x 318 feet, the balance being used for yard and other storage purposes. The structure is four stories high, with 4½ acres of floor space and 3½ acres of track-age facilities, with direct connections with all three of the transcontinental roads. Goods are thus delivered directly into the company's warehouses, reducing the cost of handling to the smallest minimum. The company is striving to keep pace with and equip itself for the rapid development of the section of the country from which its business is drawn. The most modern methods for the rapid handling and dispatching of the greatest volume of business at a minimum of cost have been adopted. The company states that Los Angeles is growing at an exceedingly rapid pace. Bank clearings have shown a healthy increase with each succeeding month of the past year. New territory is being opened up by the construction of railroads in sections heretofore undeveloped, thus affording new fields for exploiting. During the past few weeks there have been good rains throughout Southern California, insuring another year of bountiful crops.

The Hardware Store of Neal & Brinker Company.

THE Hardware store of Neal & Brinker Company, 18 Warren street, New York, occupies a building five stories high, with basement and subcellar. The frontage of the building is 25 feet and its depth 80 feet, the main floor having in the rear a glass roofed addition, which is used as the office of the sales department. In general it may be said that the first floor is devoted to the sale of goods and the service of customers, the second floor is used as a sample room, the third is occupied by the Builders' Hardware department, the fourth by the Tool department and the fifth by the bookkeeping and accounting de-

board, such as Corkscrews, Bottle Openers and the like. In order to attract the more attention and bring all sides of the pyramid into plain view of the observer it was made to revolve by a small gas motor and worm gear, a diagram of which is shown in Fig. 3. Other goods tastefully arranged in the window, either on the bed shelf or on brackets set at different heights, included Carving Sets, Skates, Five o'Clock Tea Kettles, fancy Alarm Clocks, Chafing Dishes, Coffee Percolators, &c. All was lighted up by small incandescent bulbs of different colors, which received the electric current from wires in contact with



Fig. 1.—View of First Floor from Entrance.

partments. On the first floor the attention is first attracted, perhaps, by the

SHOW WINDOW.

Care is taken to keep this window handsomely dressed with seasonable lines and make it as attractive as possible to passers-by. During December the window was occupied by the display reproduced in Fig. 2, consisting of goods especially suitable for Christmas gifts. Black cloth was used as a background for the display covering the shelving and wood work so as to set off the bright metal to best advantage. Red and white crepe paper were also employed to lighten the effect, being arranged in rosettes above and behind, as shown in the cut, while sprigs of evergreen furnished the finishing touch. The feature of the window was a pyramid erected in the center, cut off square at the top and having a different line of goods displayed on each of its four sides. These four lines comprised Pocket Cutlery, Razors and shaving accessories, Scissors, Shears, &c., and articles for the side-

two circular strips of Brass Ribbon on the bottom of the pyramid.

THE FIRST FLOOR.

By reference to the plan of the first floor, shown in Fig. 4, it will be seen that the elevator, which is used almost entirely for freight, is located at one side of the entrance and opens on the street, as well as into the store. It can be entirely shut off from the store, however, avoiding much unnecessary confusion and noise. A general idea of the first floor, which, as previously stated, is devoted to the service of customers, may be gained by comparing the plan in Fig. 4 with the general view reproduced from a photograph in Fig. 1.

A BALANCED ARRANGEMENT

is carried out so far as the structure of the building will permit, drawers and shelving extending from floor to ceiling on either side and showcases, wall cases, &c., being in pairs, on opposite sides of the room. Two aisles

extend to the rear, leaving a central space, which is devoted to glass showcases with room for clerks to pass between them as shown in Fig. 1. The effect of this orderly arrangement is heightened by a pleasing decor-



Fig. 2.—Christmas Window Display.

ative scheme which is carried throughout the shelving. Every compartment presents a uniform appearance to the eye, being filled with a sample board, drawer or shelf box, the outside surface of which is covered with dark

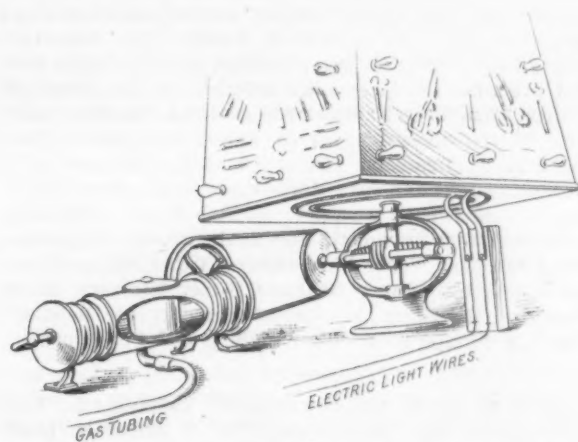


Fig. 3.—Gas Motor with Mechanism for Revolving and Lighting Pyramid.

green paper with a narrow border of light yellow. The green affords an excellent background for setting off samples, most of which of course are polished metal, while the margin relieves the eye and makes the different sections and lines of samples readily distinguishable from the floor.

(To be continued.)

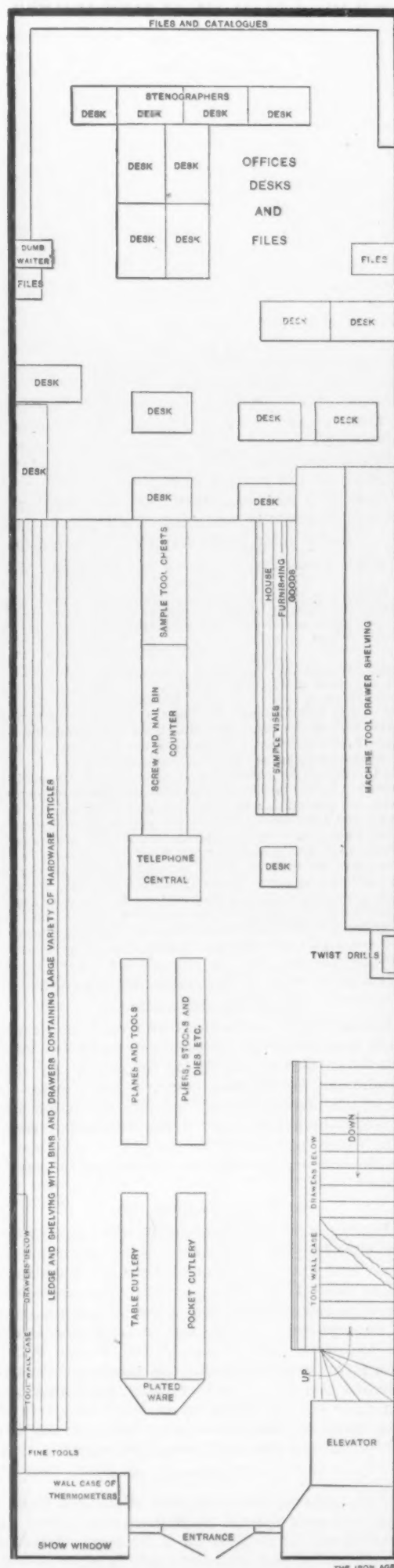


Fig. 4.—Plan of First Floor.

THE ENFORCEMENT OF RESTRICTED PRICES.

THE Hardware trade, as well as manufacturers and distributors of other lines of merchandise, will be much interested in the decision recently rendered by the United States Circuit Court of the Southern District of Ohio, to which reference was made in our last issue.

It sustains the right of a manufacturer to prevent his product being sold by a retailer below an established price. If not upset by a higher tribunal, the ruling will go a long way to establish the validity of the limited price system of sale.

The decision was in the form of a temporary injunction order, which was subsequently made permanent, granted on application of Burton Bros. & Co., silk merchants, of New York, restraining the Kinnane Bros. Company of Springfield, Ohio, from advertising, selling or offering for sale Burton Bros. & Co.'s "Banzai" silk for less than 50 cents per yard. The suit grew out of the attempted sale by the Kinnane Bros. Company of Banzai silk at 39 cents per yard.

The case also comes within the principles involved in recent decisions of other courts in cases in which prayer for injunction was made upon the ground, among others, that the contract to maintain prices had been violated to the damage of the manufacturer. Demurrers in these cases were filed and overruled, the court holding that such contracts would be sustained. Following is the text of the injunction order in the case above referred to:

United States Circuit Court, Southern District of Ohio, Western Division. No. 6120.

Frank V. Burton, Robert L. Burton, Frank L. St. John and John H. Burton, a partnership doing business under the name of Burton Brothers & Co.,

Complainants. Entry.

Versus

The Kinnane Brothers Company, a corporation under the laws of the State of Ohio,

Defendant.

Now comes the Kinnane Brothers Company, a corporation under the laws of the State of Ohio, defendant herein, by James Johnson, Jr., its solicitor, and waiving the issuance and service of summons herein, hereby enters its appearance.

And thereupon, by consent of parties, this cause coming on to be heard upon the motion of the complainants for a temporary injunction as prayed for in said bill, and it appearing to the court that for the purpose of said injunction the defendant admits the allegations of said complaint so far as is necessary to the granting of this injunction;

It is therefore ordered, adjudged and decreed by the court that the defendant, the Kinnane Brothers Company, its agents, servants, attorneys, employees and assigns, be and they are hereby each of them perpetually enjoined and restrained from advertising, selling or offering for sale "Banzai" silk at a price less than 50 cents per yard in manner and form as prayed for in said bill.

A feature of the case is that the retailing firm

Signed No Agreement.

to maintain a price and entered into no formal contract with the manufacturer. Neither was there any stipulation on the invoice accompanying the goods. By sample cards, circular letters, &c., however, they were made aware of the manufacturers' system of selling before they bought the silk, and every roll which they received bore the following label: "Banzai silk is purchased under an agreement that it will not be retailed for less than 50 cents a yard."

No Illegal Combination.

It is argued by the complainants that an agreement of this kind between two parties is not the same as if three or four different manufacturers got together and agreed to restrict the selling price of their merchandise to the consumer at less than a certain price, as this would be considered in restraint of trade and contrary to the anti-trust laws of the United States, but that where a manufacturer sells his merchandise without any combination direct to a retailer under a contract that a certain price shall be lived up to, the contract is legal and the courts will enjoin the party breaking this agreement from doing so and will award damages.

THE HUMPHRIES MFG. COMPANY, Mansfield, Ohio, has just opened a new office at 95 William street, New York, from which will be handled all of its large Eastern jobbing trade and export business. On the floor is a comprehensive line of its Pumps, both of iron and brass, for

every service, as well as samples of the company's Porcelain Enameled Sanitary Ware and Brass Goods. The branch house will be under the supervision of A. I. Laing, as manager, who is well known to the jobbing and export trade in this part of the country.

ELECTRIC LIGHTING IN THE DEPARTMENT STORE.

THE above title is that of a booklet issued by the Nernst Lamp Company, Pittsburgh, Pa., although the matter is equally applicable to illuminating any modern, well conducted store. Where colors are to be selected or compared it is vitally important that the artificial light provided does not distort or apparently change the shade of the article under consideration. This booklet seeks to explain the qualifications of the Nernst light with what is referred to by the company as its sunlight quality, combining as it does the good features, and eliminating the undesirable ones, of both arc and incandescent systems. The Nernst Lamp is such in construction as to throw most of its light downward, where needed, without a shadow in any direction. This feature of downward distribution adapts the Nernst Lamp especially to an overhead system of lighting; where the Lamps are placed near the ceiling and out of the field of vision, so that the eye is much less apt to encounter direct rays from the light source and is able to perform its function much easier and better. The Nernst Lamp is available in sizes and powers corresponding to either the arc or incandescent lamp.

TABLOID SYSTEMS.

TABLOID SYSTEMS is a book of 208 pages, compiled by the Board of Experts of the *Business Man's Magazine*. It is published by the Book-Keeper Publishing Company, Detroit, Mich. The book treats of the systematization of office records and the adaptation of labor saving methods in all departments of business. It is illustrated with a large number of blank forms suggested for special use, a general idea of which may be given by instancing the following: Card Indexing, Catalogue Indexing, Quotations Received and Given, Card Systems for Following Up Collections, Voucher Checks, Stock Records, Bill and Order Forms, Ledger Forms, &c. The book contains suggestions of probable interest to a wide range of readers.

THE BROWN & SHARPE MFG. COMPANY, Providence, R. I., has issued a catalogue supplementary to its general catalogue, devoted to the line of Reamers. The full line of Reamers, such as the company now manufactures and carries in stock, is covered in detail. This important class of small tools is manufactured with the same care and precision which are characteristic of the Brown & Sharpe Cutters. The catalogue contains complete price-lists of the several types of Reamers, which include Solid Hand Reamers, Fluted Chucking Reamers with straight shanks and with Morse taper shank, Rose Chucking Reamers with straight shanks, Screw Expansion Reamers, Shell Reamers and their arbors, Expansion Hand Reamers, Taper Pin Reamers, Taper Bridge Reamers, Locomotive Taper Reamers, Taper Reamers, Morse Standard, Roughing and Finishing, and Taper Reamers, Brown & Sharpe Standard, Roughing and Finishing.

THE STANDARD METAL COMPANY, Indianapolis, Ind., has recently been incorporated. W. J. Elder, its president, has had over 25 years' experience in the Tanners' Supply business, having formerly been connected with Tanner & Co., Indianapolis. F. A. Wilkening is secretary and treasurer of the company, and other directors are W. M. Husbands, J. F. Jewar and E. C. Folkening, all men of experience and standing in the trade. The office and warehouses of the company will be located at the corner of Illinois and South streets, where a complete stock of Tin Plate, Sheet Iron, Metals and Tanners' and Sheet Metal Workers' Supplies will be carried.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

ROCK RIVER MFG. COMPANY, Dixon, Ill.: Illustrated catalogue of Wrought and Cast Iron Specialties and Sewer Builders' and Contractors' Supplies.

STAR CORUNDUM WHEEL COMPANY, Detroit, Mich.: Catalogue of Emery and Corundum Wheels, Grinding Machinery and Sharpening Devices.

CUTAWAY HARROW COMPANY, Higganum, Conn.: Memorandum book containing maps and tabulated information and advertising Cutaway Plows, Harrows and Tools.

SIMONDS MFG. COMPANY, Fitchburg, Mass., and Chicago: A book of rules, illustrations, tables and other practical information for carpenters.

INGRAM COMPANY, Bradford, Pa.: Circular illustrating and describing its new Semicircular Level, Plumb and Inclinator combined.

SCHUCHARDT & SCHÜTTE, 136 Liberty street, New York: Illustrated price-list of Folding Rules.

WIRE GOODS COMPANY, Worcester, Mass.: Set of uniform circulars illustrating and listing various lines of seasonable goods, &c.

THE GEM CUTLERY COMPANY, 34 Reade street, New York: Illustrated booklet relating to the Zinn Razor and Zinn Automatic Shaving Set.

THE MICA MFG. COMPANY, 307-309 West Broadway, New York: Price-list of Selected Mica.

SILVER & Co., Brooklyn, N. Y.: Circular illustrating the Silver Sliding Rod Bath Seat, which is self adjusting and reversible.

B. F. MEER & SONS, Louisville, Ky.: Illustrated catalogue devoted to the Meek Fishing Reels, of which a number of styles are shown.

AMERICAN TAP & DIE COMPANY, Greenfield, Mass.: Catalogue No. 2 relating to Adamantine Threading Tools, including Screw Plates, Taps and Dies, Stocks and Tap Wrenches; also pipe tools, comprising Stocks, Dies, Taps, Cutters and Wrenches.

HORSESHOE MAGNET HAMMERS TRADE-MARK.

AN excellent example of the present tendency of manufacturers to brand their goods in a distinctive way is furnished by the trademark of the Horseshoe Magnet Hammers, illustrated herewith. The Hammers are designed for the use of bill posters, traveling advertisers, undertakers, upholsterers, &c., as well as for household

A. R. ROBERTSON
BOSTON, MASS.



Trademark of Magnet Horseshoe Hammers.

and general use. The trademark was adopted by the inventor and manufacturer, Arthur R. Robertson, 144 Oliver street, Boston, Mass., when first putting his goods on the market and the trade has always known them by this brand, recognizing that it stands for quality as well as for the special design. The manufacturer endeavors to furnish a superior tool in every respect and warrants it.

The Simms Hardware Company, Kansas City, Mo., has been succeeded by Simms-Ellfeldt Hardware Company. A. F. Ellfeldt, who has for 20 years been connected with H. J. Brunner Hardware Company, is the new member of the firm.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM MACCARTHY & HARPER, Baltimore, Md., who are enlarging their stock and extending the scope of their Hardware business.

FROM A. E. ALLEY & SON, Sherrard, Ill., who have bought the business of Chas. Stewart & Co.

FROM C. S. PETTIT, who has succeeded Allen & Pettit in the Hardware business at Springview, Neb.

FROM BOYLE BROS. & Co., Blackfoot, Idaho, who have succeeded to the Hardware business of Boyle Bros. & West.

FROM J. L. SINCLAIR, Medford, Mass., who has purchased the Hardware, Paint and Tinware business of Wm. Gibson.

FROM J. C. WRIGHT, who will open a Hardware, Stove, Paint, Sporting Goods and Harness store in Kearney, Neb.

FROM CHANDLER HARDWARE COMPANY, Chandler, Okla., which has incorporated with a capital of \$15,000, representing a consolidation of the New York Hardware Company and Fred Neal, both of Chandler.

FROM MATHES HARDWARE COMPANY, formerly of San Diego, Cal., which has opened a store in Alpaugh, Cal.

FROM LAKE HARDWARE & FURNITURE COMPANY, Florala, Ala., which has incorporated with a capital stock of \$15,000.

FROM EARNEST BROS., North Loup, Neb., who has purchased the Hardware, Stove, Implement, Paint and Sporting Goods business of S. J. W. Brown.

FROM MASON BROS. HARDWARE COMPANY, Claremore, Ind. Ter., successor to Claremore Hardware Company.

FROM S. MCCLENAGHAN, JR., who has succeeded McClenaghan Bros., Primrose, Neb.

FROM ETLING & SPRIGG, Belpre, Kan., successors to the Hardware and Implement business of King & Sprigg.

FROM S. MINER, JR., Sabetha, Kan., who has purchased the Hardware, Stove and Sporting Goods business of A. N. McCleary.

FROM C. W. FOWLER, who has succeeded to the Hardware, Stove and Paint business of Silverthorn & Fowler, Tryon, Okla.

FROM L. D. ROHSEY & Co., Dwight, Neb., who have bought the Hardware, Stove and Paint business of J. Ably.

FROM ALVIN WOOLSEY, Bern, Kan., who has purchased the Hardware store of Poppe & Son.

FROM WYOMING HARDWARE & SADDLERY COMPANY, Wheatland, Wyo.

FROM GADD-BOYNTON HARDWARE COMPANY, Cedar Rapids, Iowa, which has succeeded the Cedar Rapids Hardware Company.

FROM A. MADSEN & SONS, who will add Hardware to the stock of their new general store at Beardsley, Kan.

FROM C. R. EIDSON & SON, Exeter, Mo., who are embarking in the Hardware, Stove, Implement, Furniture and Saddlery business.

ED. FORD ON TRADE QUESTIONS.

Letter No. 3.

Hardware as Premiums.

To the Editor: From time to time we hear comments about manufacturers selling direct to premium houses or "scheme" goods concerns. I doubt if it is realized by the retailer that 85 per cent. of the individual sales, not volume of business, is now made by the retailers and jobbers; both are overzealous for this class of business today. After they have built up a trade that is too large for them to handle they should not deprecate the fact that the manufacturers are taking care of the business direct.

The manufacturer of a well-known line was severely criticised by the trade because the goods were being offered as premiums with chewing gum, and upon investigation it was found that a large jobber, a member of the National Association, was supplying the goods and the manufacturer knew nothing of the transaction.

This same manufacturer had a similar experience quite recently with another member of the Jobbers' Association, who had been supplying goods on a premium proposition. The premium man wrote the manufacturer direct, but was referred back to the jobber, who was very anxious to hold the business and quoted prices very near to cost, as the orders enabled the jobber to more than double the volume of business on this line. In fact, the premium man was using many more goods than the jobber had ever bought before, and the volume was such as to command the factory's attention. As Mr. Premium Man was using such quantities of the goods, and as his business was so much greater than the jobber's ordinarily, he objected to paying the jobber a profit. The premium man finally took up another line of similar goods that he could buy direct, and the jobber was indignant at the other manufacturer and tried to make it unpleasant for him because of this transaction.

If it was right for the jobber to sell this premium house it certainly was proper for the manufacturer to do so, as the volume of business warranted direct shipments. If the jobber sold this premium man goods at a low price, which was less than to any of his regular customers, it was certainly fair for the manufacturer to take the business at regular—not cut—prices.

I know positively that retailers and jobbers are extremely anxious to sell this class of trade and they solicit it. After they have built it up they should not deprecate

steel, the face of which is ground straight, as is the reverse side, for use either way. The blade, 0.045 inch thick and $\frac{7}{8}$ inch wide, is spring tempered and riveted on top of the head, so that the blade forms a bearing to



Fig. 1.—Draftsmen's Nickeled T-Square.

guide a draftsman's triangle, &c., back past the face of the head, not striking against it, as would be the case if the blade was sunk flush with the head. The instrument is both light and accurate, the 14-inch size weighing only 5 ounces, and $5\frac{1}{2}$ and 6 ounces for the 16 and 18 inch sizes, respectively, the three sizes all having 8-inch heads. Fig. 2, Blacksmiths' hook and handle rule, No. 465, is made from hard rolled sheet brass 1-10 inch thick and 1 1-16 inches wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one



Fig. 2.—Blacksmiths' Hook and Handle Rule.

side and from the inside of the hook in sixteenths of an inch on the other, thus adapting the rule for taking correct measurements from either the outside edge of a hot piece of iron or from the inside when held against a corner. The graduations extend 12 inches, the handle is flat and the over all length is 16 $\frac{1}{4}$ inches.

Victor Reversible Chain Wrench.

C. E. Bonner Mfg. Company, Chrisman, Ill., is offering the chain wrench shown herewith. The handle hitch has a shoulder reinforcement to protect and strengthen the jaws. The jaws are fitted so perfectly, it is explained, that the strain practically comes against the shoulder. It is pointed out that the jaw is made heavy enough so that



Victor Reversible Chain Wrench.

the fact that manufacturers are following the example they have set.

The company I represent is practically free from this class of business, so this article is not written in self defense, but rather to sound the alarm and place the blame where it properly belongs.

If the retailer and jobber continue to cater to this class and build it up, as did the jobbers the catalogue house, until the trade becomes too large for them longer to handle, the manufacturers should not be blamed for conditions that are sure to follow.

ED. FORD.

Draftsmen's T-Square and Blacksmiths' Rule.

The L. S. Starrett Company, Athol, Mass., and 123 Liberty street, in charge of L. H. Briggs, has just added to its large stock of mechanics' fine tools the draftsmen's T-square and blacksmiths' hook and handle rule here shown. The T-square, No. 171, Fig. 1, is very light, made of steel, polished and nickeled, and is well suited to use in manual training schools, colleges, &c., as well as by the professional user. The head is struck up from sheet

with its reinforced shoulder it is sufficient to stand any strain that may be placed upon it. The bolt is made of Swedish iron. The jaws are interchangeable, and the hitch is a part of the handle and forged in the same. The wrench is made in four sizes, Nos. 11, 12, 13 and 13 $\frac{1}{2}$.

Standard Steel Angle Fence Posts.

The wire fence shown in Fig. 1 is erected on Standard steel angle posts, manufactured by J. H. Downs, 235 Broadway, New York. The posts are made of high carbon steel angles, perforated to receive staples inclosing the fence wire, as shown in Fig. 2. The perforations are made on order to accommodate any kind of wire fence. All posts are dipped in high grade black asphaltum paint, which affords them permanent protection. They are driven into the ground, thus saving the labor and expense of digging post holes. A collar made of vitrified clay burned hard is used to reinforce the post in the ground. It is a loose fit and is slid down on the post after it is driven, leaving about 1 inch of the collar above ground. Posts extend down about 2

feet below the collars, the loose sockets affording effectual drainage for any water settling at the surface around the posts. Collars are furnished in 6 or 12 inch lengths, according to the size of the posts. Angles are also made in different weights and lengths. Extra heavy posts are for use at corners and ends, with angle steel braces, as shown in Fig. 1. This cut also shows how

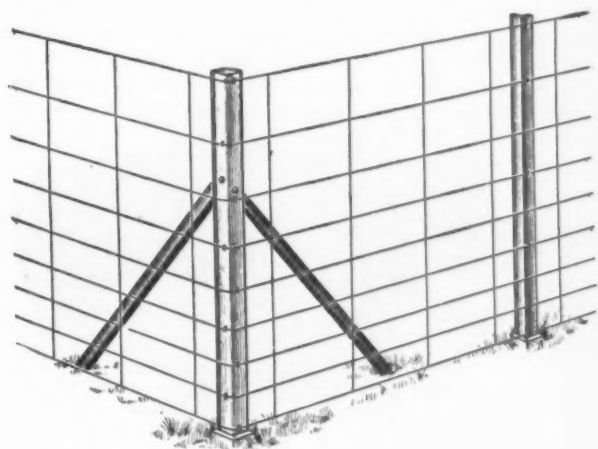


Fig. 1.—Fence Constructed on Standard Steel Angle Posts.

a corner angle may be used with a wood center, allowing a fence to be carried around in one piece. Grape arbors, clothes posts, hitching posts, &c., may be constructed of this angle steel, and ornamental tops are supplied when it is used for lawns, parks, cemeteries, &c. It is argued in its favor that it does away with the wood post, which

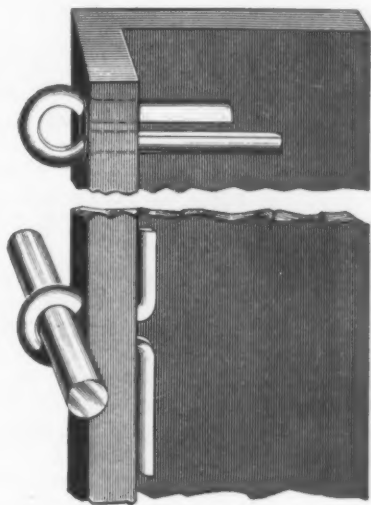


Fig. 2.—Steel Angle Post, Showing Method of Fastening Fence Wire with Staples.

is the one weak point in a wire fence; that it will not decay or burn; is proof against dampness; is easily and cheaply set up, and the first cost is not great, as compared with wood posts at the present price of lumber.

Metallic Adjustable Screen.

The metallic adjustable screens herewith illustrated, manufactured by the Metallic Screen Company, Collins, Wis., are designed with a view of preventing warping, shrinkage or swelling, and the manufacturer claims that they will always retain their shape and are water and rustproof. The frames are of galvanized iron construction and the material is of such weight as to make them very rigid. The screen cloth has a galvanized finish and is rustproof, and is clinched to the metal in such a manner as to form only one thickness of sheet iron, which prevents the gathering of moisture. Fig. 1 is an illustration of the full screen, which is so constructed that the lower section can be raised the same as the window, it sliding into the upper section. The outside corners are

braced with triangles of sheet iron reinforced with two ribs soldered to the corners and riveted with copper rivets. The fasteners and catchers are also soldered and riveted to the frame. Fig. 2 shows the transversely ad-

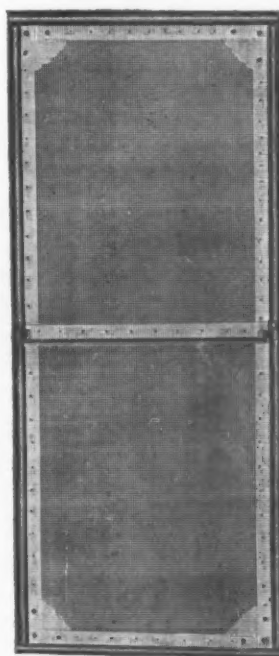


Fig. 1.—Full Metallic Adjustable Screen.

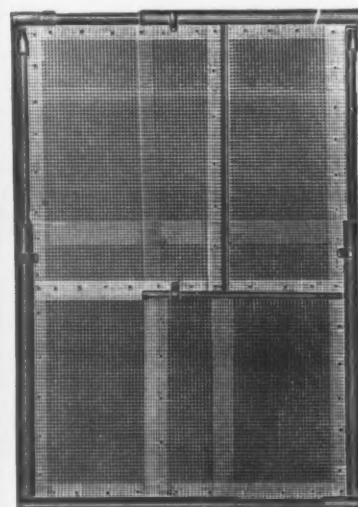


Fig. 2.—Transversely Metallic Adjustable Screen.

justable screen and is designed to fit any window within range of its adjustment. It is securely fastened within the sash slide by means of lockers. They also telescope for storage, thus requiring little room. Fig. 3 shows the

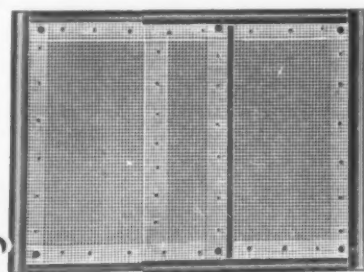
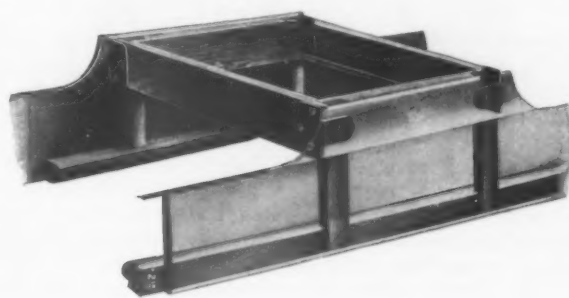


Fig. 3.—One-Way Metallic Adjustable Screen.

One Way adjustable screen. This can be fitted to any window within its range of size.

Hold Fast Frame Clamp.

The George Delker Company, Henderson, Ky., is uniting the framework and seat posts of the body of its buggies with the frame clamp shown herewith. It is made of heavy wrought steel and holds the parts, it is explained,



Hold Fast Frame Clamp.

in such a manner that they cannot spread or become loose, thereby adding years to the life of a buggy body. Attention is also directed to the heavy rounded seat posts and heavy sills.

Meteor Circulating Coffee Percolator.

Manning, Bowman & Co., Meriden, Conn., and 25 West Broadway, New York, in charge of H. S. Mirrielees, manufacturing largely nickel and silver plated teaware, chafing dishes, table kettles, &c., have just added to their line of percolating coffee urns and pots the Meteor circulating coffee percolator, here illustrated. The result from this structural principle when the Meteor pot is placed on range or other stove is that the nickeled iron disk or plate brazed to the recessed one-piece bottom prevents the heat from boiling the filtered infusion. As the



Fig. 1.—Meteor Circulating Coffee Percolator.

separate disk does not get in direct contact with the beverage it acquires an intense heat and transmits it directly to the small quantity of water under the oval valve at the bottom of center tube, which fits friction-tight into the recessed bottom, but which is easily removed for cleansing. The heat acting first and most quickly on the relatively small volume of water in the depressed portion, steam generates very quickly and forces the heated liquid up through the perforated removable tube at top, spraying it under the dome-like glass cover over the ground coffee in the metal filter having a perforated (not wire) bottom. The snug-fitting glass cover, held securely by a partial turn under two small lugs, not only retains the aroma, because it is unnecessary



Fig. 2.—Sectional View of Percolator.

to remove it at table, but enables the hostess to tell exactly when the circulatory action begins in making coffee. In the top of the glass cover is a small vent hole to allow surplus steam to escape. Either freshly boiled hot water or cold water can be used, cold water merely taking a little more time. By this process the coffee is never boiled and the injurious, astringent, bitter tannic acid is not extracted, as the ground coffee remains in the filtering section above and cannot enter the reservoir containing the distilled and filtered infusion, which likewise needs no settling. With this device coffee of full, delicate flavor, aroma and strength is obtained in from five to eight minutes when boiling water is used. Another feature emphasized by the manufacturers is that aside from the hygienic element there is about one-third saving in material. This utensil is equally suitable for making tea, which also contains tannic acid. The body of the pot is made of copper, polished and nickeled, with cool

ebonized wood handle. There are four sizes, the capacities of which are 2, 3, 4 and 5 pints. A stand and lamp are also made by them to be used with alcohol for heating the contents of the pot.

The New Oliver Vise No. 56.

The accompanying cuts represent a vise and modifications of it put on the market by the Oliver Machinery Company, Grand Rapids, Mich. The vise has an adjustable front jaw and is made in different sizes. It is designed for the use of wood workers, including carpenters, cabinet makers, pattern makers, &c. Among the impor-



Fig. 1.—The New Oliver Vise. Fig. 2.—Vise in Position on Bench.

tant features of the vise the following are mentioned: The casting for the main frame is substantial to insure rigidity; it is provided with 1-inch cold rolled steel guide rods; a malleable screw 4 inches long and 1½ inches in diameter, with a square thread operating through a 2-inch nut that completely encircles it, allowing, when desired, a 2-inch screw adjustment; the vise closes with a rapid action; the adjustable front jaw raised 1 inch

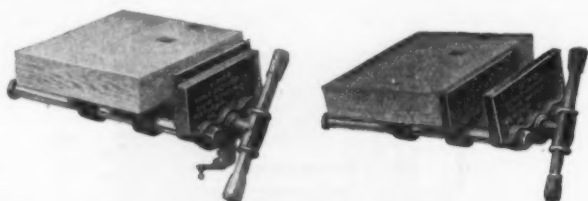


Fig. 3.—Vise Without Back Jaw. Fig. 4.—Vise with Plain Front Jaw.

above the bench top is full length of the back jaw, this arrangement being referred to as not indenting wood as small 1-inch dogs will, and that with this style of jaw a tail vise is not needed. Also that the vise will clamp taper, straight or circular work when used in conjunction with side clamping plate and dogs. The vise is shown in Fig. 1 with the front jaw raised to full height and also gives a general view of the vise. The vise in position on a bench is illustrated in Fig. 2, with maple faced jaws

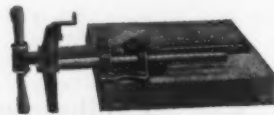


Fig. 5.—Working Parts of Vise.

and a side clamping plate and dog. The vise without a back jaw is illustrated in Fig. 3, as preferred sometimes by those who desire to use the side of the bench as a back jaw. Fig. 4 shows the vise modified with a plain front jaw, which is a common form used by those not caring to clamp irregular forms. The vise as located on the under side of the bench is illustrated in Fig. 5 and gives a correct view of the working parts. The vise is guaranteed by the manufacturer against breakage or appreciable wear for five years.

B. E. Seaver and E. H. Bush, Tecumseh, Neb., have purchased the C. S. Campbell stock of Hardware, Stoves, furniture, &c., and will remodel the store, continuing the business under the style of Seaver & Bush.

The Burt Ventilator.

The Burt Mfg. Company, Akron, Ohio, maker of oil filters and exhaust heads, has recently begun the manufacture of ventilators. The Burt ventilator is especially noteworthy for a patent damper, which consists of a sliding sleeve to regulate the outflow of air from the ventilator without cutting off light in the case of the glass top ventilators or shaking dust which is sometimes the accompaniment of the movement of a flat damper. Its general construction is shown in the accompanying illustration.



The Glass Top Burt Ventilator.

tion, which represents it with flat glass top, with heavy wired glass, so that it can be employed both as a skylight and as a ventilator. The damper is shown, together with the cord and pulley by which it is operated from below. The cord may be fastened at the lower end, or a counterbalance may be used to keep the damper in position. Care is exercised in making the air shaft round, so that the sliding sleeve can be moved without friction, and the shaft is strengthened by heavy bands. When the damper is at its highest point it is in contact with the top, in order to close completely the air outlet from the ventilator. Another of the special details of the ventilator is that below the glass top is a drain into which any water condensed from the air on the under side of the glass can run. The water passes through small holes, indicated in the illustration, to the outside of the ventilator. The ventilator is made with a metal top when desired, but otherwise the construction is that described. The regular patterns are built of galvanized iron and the glass top or skylight feature is made flat in sizes as large as 40 inches in diameter, but in larger sizes is given a sectional glass top of pyramidal form.

Bay State Ratchet Wrenches.

The Tudor Mfg. Company, 147 Milk street, Boston, is putting on the market as a part of its Bay State line of quick-acting small tools a ratchet wrench adapted



Bay State Ratchet Wrench.

for various purposes. The opening of the wrench is in a cylindrical part, having upon its circumference a ratchet forming a cylindrical rack. In a recess of the wrench is a spring pawl containing from five to ten ratchet teeth, according to size, all of which engage the cylindrical part during the forward motion of the wrench, but permit the wrench to operate freely in the reverse direction. This feature renders the wrench useful for many purposes, obviating the necessity of removing it from a nut or bolt head while working. The Bay State ratchet wrench shown in the illustration is designed for general use and is manufactured in 15 sizes to take standard hexagonal cap screws from $\frac{1}{4}$ to $1\frac{1}{2}$ inches. This type of wrench is also made as an automobile ratchet tire lug wrench, in

four sizes to fit lugs $\frac{1}{2}$, 9-16, $\frac{5}{8}$ and $\frac{3}{4}$ inch, and as a lineman's cross-arm ratchet wrench. A wrench of similar purpose is manufactured by the same company, known as the Bay State double-headed wagon tire nut wrench, in which a friction takes the place of the ratchet. The cylindrical part has a smooth peripheral surface and is engaged by a friction roll held in a recess in the wrench, the friction engaging on the forward movement of the wrench and permitting the wrench to turn with no engagement whatever on the reverse motion, a necessary function of a wrench for this purpose, even the friction of a pawl passing over the ratchet surface being sufficient

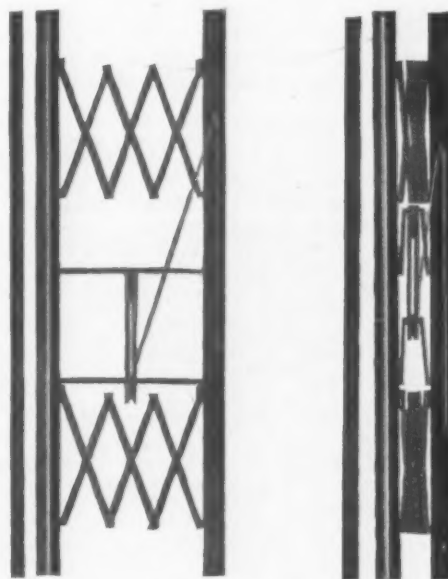


Bay State Double Headed Wagon Tire Nut Wrench.

to carry back a wagon tire nut which is usually a loose fit on a rolled thread. This wrench has one opening for a $\frac{1}{4}$ -inch, the other for a 3-16-inch bolt.

Record's Folding Portiere Framework.

Record Mfg. Company, Conneaut, Ohio, is putting on the market folding portière doors, porch screens, office partitions, show window backs, restaurant stall partitions, &c., in which the folding portière framework, shown open and folded in the accompanying cuts, is used. Curtain rolls, which act automatically with a spring, are encased in the stile on both sides of the door, and the curtains form the body of the door. The other edge of the door is hinged to a steel strip, so that it may be opened or closed as an ordinary door. When desired the framework can be drawn out, when it locks into a full door, which is automatically covered with the curtains. The device can then be used as a regular door in connection with portières or not. By drawing a cord the door folds itself by the action of the springs, occupying about one-third of the space, and can be swung back into a very narrow corner. The framework is

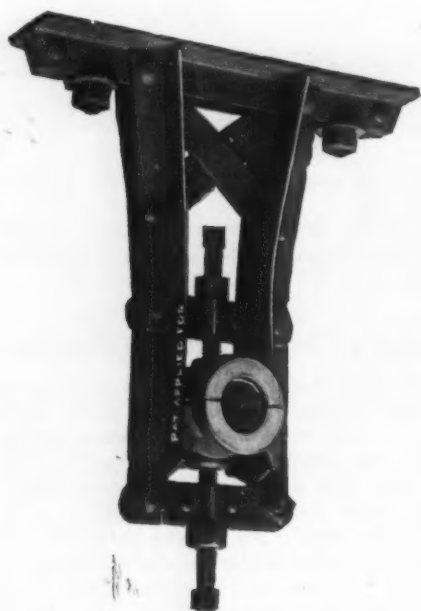


Record's Folding Portière Framework.

painted to correspond with the surrounding woodwork. Moderate priced curtains or the most expensive and rich furnishings may be applied to the framework. The curtains can be readily replaced by others when desired. Among the advantages claimed for these doors are: That when open they do not occupy as much space as regular doors; that they take the place of portières, at the same time preventing drafts, deadening sound and retarding the carrying of dust from one room to another, while serving to embellish and beautify the rooms in the same way that portières do.

The Nassau Structural Steel Hanger.

As indicated by the accompanying illustration and as its name implies, this hanger, which has just been placed upon the market by the Nassau Machine Works, 55 Furman street, Brooklyn, N. Y., is made of rolled steel angles and cast steel boxes. The latter are provided with separate babbitt liners, which will admit replacing without the necessity of taking down either hanger or shafting. The use of rolled steel shapes properly braced and riveted, while new and novel in the making of a hanger,



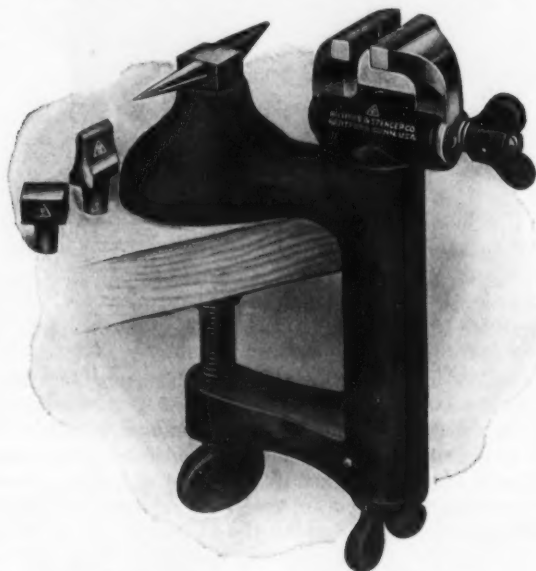
The Nassau Structural Steel Hanger.

has been so thoroughly proved to withstand a working strain in other fields of usefulness that the designer felt no hesitancy in adopting the principle of the steel structure as employed in the construction of railway bridges, cranes, &c., in the formation of a steel hanger. That the theory is correct the maker claims to have proved by results of most severe and protracted tests made at the plant before the hanger was placed upon the market. The Nassau hanger has been designed so that all strains

are calculated with a good margin of safety. The object in designing this hanger was to replace heavy cast-iron construction with a neater, lighter and stronger article, which the manufacture of Bessemer steel has made not only possible but absolutely necessary in so many other instances. The manufacturer offers the millwright a 50 per cent. lighter load to hold up, and the shipper 50 per cent. saving in freight. The hanger is to be sold by all supply and heavy hardware merchants.

B. & S. Combination Vise Clamp and Anvil.

The convenient combination tool shown herewith is designed for the use of jewelers and tool makers and for fine work generally. It comprises a drop-forged hand vise with parallel jaws, a clamp and anvil-base of one



B. & S. Combination Vise Clamp and Anvil.

piece, a drop-forged horn and square anvil and hardy. The hand vise is easily adjusted to and removed from the clamp. The handle of the vise extends into the clamp and is secured by a screw at the bottom. The jaws of vise and the anvils and hardy are polished, and the whole is handsomely finished. It is manufactured by The Billings & Spencer Company of Hartford, Conn.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	42	@43
Linseed, City, Boiled.....	43	@44
Linseed, State and West'n, raw.....	40	@41
Linseed, raw Calcutta seed.....	46	@47
Lard, Extra Prime, Winter.....	70	@71
Lard, Extra No. 1.....	68	@69
Lard, No. 1.....	38	@40
Cotton-seed, Crude, f.o.b. mills.....	27 1/2	@28
Cotton-seed, Summer Yellow.....	33	@34 1/2
off grades.....	33	@34 1/2
Sperm, Crude.....	51	@52
Sperm, Natural Spring.....	51	@52
Sperm, Bleached Spring.....	51	@52
Sperm, Natural Winter.....	60	@61
Sperm, Bleached Winter.....	63	@64
Tallow, Prime.....	51	@52
Whale, Crude.....	31	@32
Whale, Natural Winter.....	36	@37
Whale, Bleached Winter.....	40	@41
Extra Bleached Winter.....	44	@45
Menhaden, Brown, Strained.....	26	@27
Menhaden, Light, Strained.....	27	@28
Menhaden, Bleached, Winter.....	32	@33
Menhaden, Ex-Bld., Winter.....	31	@32
Menhaden, Southern.....	26	@27
Cocanut, Ceylon.....	7 1/2	@8 1/2
Cocanut, Cochiti.....	7 1/2	@8 1/2
Cod, Domestic, Prime.....	32	@33
Cod, Newfoundland.....	35	@36
Red, Elaine.....	35	@36
Red, Saponified.....	4 1/2	@5 1/2
Olive, Italian, bbls.....	67	@68
Neatsfoot, prime.....	48	@49
Palm, Logos.....	6 1/2	@7 1/2

Mineral Oils—

Black, 28 gravity, 25@30 cold test.....	10 1/2	@11 1/2
Black, 28 gravity, 15 cold test.....	11 1/2	@12 1/2
Black, Summer.....	10 1/2	@11 1/2
Cylinder, light filtered.....	18	@19
Cylinder, dark filtered.....	16	@17
Paraffine, 903-907 gravity.....	13 1/2	@14
Paraffine, 903 gravity.....	12 1/2	@13
Paraffine, 883 gravity.....	10 1/2	@11 1/2
Paraffine, Red.....	12 1/2	@13 1/2
In small lots 1/2¢ advance.		

Miscellaneous—

Barytes:		
White, Foreign.....	17.50	@19.00
Amer. floated.....	18.00	@19.00
Off color, No. 2.....	13.50	@15.00
Chalk, in bulk.....	3.00	@3.25
Chalk, in bbls.....	100 lb	@3.50
China Clay, English.....	12.00	@17.00
Cobalt, Oxide.....	100 lb	2.50 @ 2.60
Whiting, Common.....	100 lb	.45 @ .48
Whiting, Gliders.....	100 lb	.50 @ .55
Whiting, Ex. Gliders.....	100 lb	.55 @ .60

Putty, Commercial—

In bladders.....	1.70	@1.85
In bbls. or tubs.....	1.20	@1.40
In 1 lb to 5 lb cans.....	2.65	@2.95
In 12 1/2 to 50 lb cans.....	1.50	@1.90

Spirits Turpentine—

In Oil bbls.....	69 1/2	@70
In machine bbls.....	70	@70 1/2

Glue—

Cabinet.....	11	@15
Common Bone.....	7	@9
Extra White.....	18	@24
Foot Stock, White.....	11	@14
Foot Stock, Brown.....	8	@11
German Hide.....	12	@18
French.....	10	@40
Irish.....	13	@16
Low Grade.....	9	@12
Medium White.....	14	@17

Gum Shellac—

Bleached Commercial.....	40	@42
Bone Dried.....	50	@52
Button.....	40	@45
Diamond I.....	53	@54
Fine Orange.....	46	@50
A. C. Garnet.....	41	@42
D. C.....	60	@62
Octagon B.....	43	@44
T. N.....	43	@44
V. S. O.....	54	@55

Colors in Oil—

Black, Lampblack.....	12	@14
Black, Chinese.....	36	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	11	@14
Green, Chrome.....	12	@16
Green, Paris.....	24	@25
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9 1/2	@9 3/4
Lead, American white, in Oil:		
Lots of 500 lb or over.....	7 1/2	@7 1/2
Lots less than 500 lb.....	7 1/2	@7 1/2
In Barrels, in oil, 25 lb tin		
pails, add to keg price.....	1/2	@ 1/2
Lead, White, in oil, 12 1/2 lb tin		
pails, add to keg price.....	1	@ 1
Lead, White, in oil, 1 to 5 lb		
as test tins, add to keg price.....	1 1/2	@ 1 1/2
Lead, American, Terms: For lots 12		
tons and over 1/4¢ rebate; and 2% for		
cash if paid in 15 days from date of		
invoice; for lots of 500 lbs. and over		
2% for cash if paid in 15 days from		
date of invoice, for lots of less than		
500 lbs. net.....	6 1/2	@ 6 1/2
Lead, White, Dry, in bbls.....	4 1/2	@ 5
Zinc, American, dry.....	4 1/2	@ 5
Zinc, French:		
Paris, Red Seal, dry.....	9 1/2	@ 10 1/2
Paris, Green Seal, dry.....	10 1/2	@ 11 1/2
Antwerp, Red Seal, dry.....	8 1/2	@ 9 1/2
Antwerp, Green Seal, dry.....	10	@ 11
Green Seal:		
Lots of 1 ton and over.....	12 1/2	@13 1/2
Lots of less than 1 ton.....	13 1/2	@14 1/2
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11 1/2	@12 1/2
Lots of less than 1 ton.....	12 1/2	@13 1/2
Discounts.—French Zinc.—Discounts		
to buyers of 10 bbl. lots of one or mixed		
grades, 1%: 25 bbls., 2%; 50 bbls., 4%.		

Dry Colors—

Black, Carbon.....	6	@10
Black, Drop, American.....	4	@ 6
Black, Drop, English.....	5	@15
Black, Ivory.....	16	@20

Lamp, Com.....	4 1/2	@ 6
Blue, Celestial.....	4	@ 6
Blue, Chinese.....	29	@32
Blue, Prussian.....	27	@30
Blue, Ultramarine.....	4 1/2	@15
Brown, Spanish.....	3 1/2	@ 4
Carmine, No. 43.....	33.50	@34
Green, Chrome, ordinary.....	3 1/2	@ 4
Green, Chrome, pure.....	17	@25
Lead, Red, bbls., 1/2 bbls. and kegs:		
Lots 500 lb or over.....	7 1/2	@ 7 1/2
Lots less than 500 lb.....	7 1/2	@ 7 1/2
Litharge, American, bbls.....	7 1/2	@ 7 1/2
Ocher, American.....	10	@11
Ocher, American Golden.....	2 1/2	@ 3 1/2
Ocher, French.....	1 1/2	@ 2 1/2
Ocher, Foreign Golden.....	3	@ 4
Orange Mineral, English.....	10	@12
Orange Mineral, French.....	10 1/2	@12 1/2
Orange Mineral, German.....	8 1/2	@10
Orange Mineral, American.....	8 1/2	@ 9 1/2
Red, Indian, English.....	4 1/2	@ 5 1/2
Red, Indian, American.....	5	@ 6 1/2
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	4	@10
Red, Venetian, Amer.....	100 lb	\$0.50 @1.25
Red Venetian, English.....	100 lb	\$1.15 @1.75
Sienna, Italian, Burnt and		
Powdered.....	3	@ 9 1/2
Sienna, Ital., Raw, Powd.....	3	@ 6 1/2
Sienna, American, Raw.....	1 1/2	@ 2
Sienna, American, Burnt and		
Powdered.....	1 1/2	@ 2
Talc, French.....	10	@15.00 @30.00
Talc, American.....	10	@15.00 @25.00
Terra Alba, French.....	100 lb	90 @1.00
Terra Alba, English.....	100 lb	90 @1.00
Terra Alba, American.....	100	@1.00
Terra No. 1.....	70	@80
Terra Alba, American.....	100	@1.00
No. 2.....	60	@65
Umber, Key, Bnt. & Pow.....	2 1/2	@ 3 1/2
Umber, Turkey, Raw & Pow.....	2 1/2	@ 3 1/2
Umber, Burnt, Amer.....	1 1/2	@ 2
Umber, Raw, Amer.....	1 1/2	@ 2
Yellow Chrome.....	12	@14
Vermilion, American Lead.....	10	@25
Vermilion, Quicksilver, bulk.....	66	@66
Vermilion, Quicksilver, bag.....	75	@80
Vermilion, English, Import.....	75	@80
Vermilion, Chinese.....	30.90	@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ %, @ 33 $\frac{1}{2}$ %, & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$ % per cent. discount to 33 $\frac{1}{2}$ %, and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 $\frac{1}{2}$ %
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils.....@ 6 $\frac{1}{2}$ @7 $\frac{1}{2}$
Hay-Budden, Wrought.....@ 9 $\frac{3}{4}$ @
Horseshoe brand, Wrought.....@ 9 $\frac{3}{4}$ @
Trenton.....@ 9 $\frac{3}{4}$ @

Imported—

Peter Wright & Sons.....@ 10 $\frac{1}{2}$ @
Anvil, Vise and Drill—
Millers Falls Co., \$18.00.....15&10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....33 $\frac{1}{2}$ %

Augers and Bits—

Com. Double Spur.....75@75&55%
Jennings' Patin., reg. finish.....50&19@60

Black Lap or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forster Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25%
No. 30, R. Jennings' list.....25&10&2 $\frac{1}{2}$ %
Russell Jennings.....25&10&2 $\frac{1}{2}$ %
L'Hommiedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Twist.....60&10%
Snell's Car Bits, 12-in. twist.....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$18; large, \$26.....50&10%
Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$26;.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat.....25%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10.....\$4.00; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00
Ames.....25&10%
Universal.....20%
Wood's Universal.....25%
Ship Augers and Bits—
Ship Augers.....45&5@
Ford's.....33 $\frac{1}{2}$ @25%
C. E. Jennings & Co.:
L'Hommiedieu's.....15%
Watrous's.....35&5%
Ohio Tool Co.'s.....40%
Snell's.....40%

Awl Hafts—See Handles, Mechanics' Tool.

Awls—

Brad Awls:
Handled.....gro. \$2.75@3.00
Unhanded, Shlided.....gro. \$3@3.66
Unhanded, Patent.....gro. \$6@70¢

Peg Awls—

Unhanded, Patent.....gro. \$1@3 $\frac{1}{4}$
Unhanded, Shlided.....gro. \$3@70¢

Scratch Awls—

Handled, Com.....gro. \$3.50@4.00
Handled, Socket.....gro. \$11.50@12.00
Hurwood.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights:
First Quality.....\$4.75@5.00
Second Quality.....\$4.25@4.50
Double Bit, base weights:
First Quality.....\$7.00@7.50
Second Quality.....\$6.50@6.75

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar.....1 $\frac{1}{2}$ @1 $\frac{1}{2}$
Concord, Solid Collar.....1 $\frac{1}{2}$ @1 $\frac{1}{2}$
No. 1 Common, Loose.....3 $\frac{1}{2}$ @3 $\frac{1}{2}$

No. 1 $\frac{1}{2}$ Com., New Style3 $\frac{1}{2}$ @4 $\frac{1}{2}$
No. 2 Solid Collar.....4@4 $\frac{1}{2}$
Half Patent:
Nos. 7, 8, 11 and 12.....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18.....75&10@75&10&5%
Nos. 19 to 22.....75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb. 4 $\frac{1}{2}$ @5 $\frac{1}{2}$
Common and Concord, turned lb. 5 $\frac{1}{2}$ @6 $\frac{1}{2}$
Half Patent.....lb. 8 $\frac{1}{2}$ @9 $\frac{1}{2}$

Bait—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—

Caldwell new list.....50%
Pullman.....50&10@60%

Spring Balances—

Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 40 lb. per lb., 3@3 $\frac{1}{4}$

Towel—

No. 10 Ideal, Nickel Plate.....\$ gro. \$8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.85;
Tinned.....\$1.00
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.10;
Tinned.....\$1.20
No. 10 Wire Galvanized.....\$ doz. \$1.75
Western W. G. Co.:
No. 1 Electric.....\$ gro. \$7.80
No. 2 Buffalo.....\$ gro. \$9.00
No. 3 Perfection Dust.....\$ gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned.....\$ doz. \$1.20
Holt, No. B, Japanned.....\$ doz. \$1.50
Holt, No. C, Japanned.....\$ doz. \$2.00
Holt, No. D, Tinned.....\$ doz. \$2.25
Lyon, No. 2, Japanned.....\$ doz. \$1.25
Lyon, No. 3, Japanned.....\$ doz. \$1.50
Taplin Mfg. Co.:
No. 60 Improved Dover.....\$ doz. \$6.00
No. 75 Improved Dover.....\$ doz. \$6.50
No. 100 Improved Dover.....\$ doz. \$7.00
No. 102 Improved Dover, Tin'd.....\$ doz. \$8.50
No. 150 Improved Dover, Hotel.....\$ doz. \$15.00
No. 152 Imp'd Dover, Hotel, T'd.....\$ doz. \$17.00
No. 200 Imp'd Dover Tumbler.....\$ doz. \$8.50
No. 202 Imp'd Dover Tumbler, T'd.....\$ doz. \$9.50
No. 300 Imp'd Dover Mammoth.....\$ doz. \$25.00
Western W. G. Co., Buffalo.....\$ doz. \$7.00
Wonder (R. M. Co.), $\frac{1}{2}$ gro. net, \$6.00

Bellows—

Blacksmith, Standard List.....60&10@70&10%

Hand—

Inch. 6 7 8 9 10
Doz. \$4.75 5.70 6.65 7.60 8.55

Molders—

Inch. 9 10 11 12 13
Doz. \$8.00 9.00 10.50 12.50 14.50

Bells—

Ordinary goods.....75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey.....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's.....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....60&10%
White Metal.....60%
Nickel Plated.....50&10@60%
Swiss.....80@80&7 $\frac{1}{2}$ %
Cone's Globe Hand Bells.....33 $\frac{1}{2}$ @35%
Silver Chime.....33 $\frac{1}{2}$ @35%

Miscellaneous—

Farm Bells.....lb. 2 $\frac{1}{2}$ @
Steel Alloy Church and School.....50&10@60%
American Tube & Stamping Co. Gongs.....75%
Table Call Bells.....\$6@50&10%

Belting—Leather—

Extra Heavy, Short Lap.....60&55%
Regular Short Lap.....60&10&55%
Standard.....70%
Light Standard.....70&55%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).....75@75&55%
Common Standard.....70@70&10%
Standard.....60&5@60&10%
Extra.....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Green River Tire Benders and Upsetters.....20%

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—Tackle—

Common Wooden.....70&10@75%
Hartz St. Tackle Blocks.....50&50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%
Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33 $\frac{1}{2}$ %

Boils—

Carriage, Machine, &c.—
Common Carriage (cut thread):
% x 6 and smaller.....75@
Larger and Longer.....65&5@
Phila. Eagle \$3.00 list May 21, '99.....80%

Bolt Ends, list Feb. 14, '95.....65&10@
Machine, % x 4 and smaller.....75@
Machine, larger and longer.....65&5@
Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch.....3 4 5 6 8
Per doz. \$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz.....\$1.20 1.50 2.25
Cast Iron Chain, Flat Japanned:
Inch.....6 8 10
Per doz.....\$1.00 1.40 1.85
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.75 .85 1.25
Wrt Barrel Jap'd.....80@80&10%
Wrt "Bronzed".....50@50&10%
Wrt Spring.....70&10@70&10&10%
Wrt Shutter.....50&5@50&10&5%
Wrt Square Neck.....75@75&10%
Wrt Square 66% x 106% x 106% x 106%
Ives' Patent Door.....80%

Plow and Stove—

Plow.....65&10@
Stove.....87 $\frac{1}{2}$ @10@

Tire—

Norway Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila. list Oct. 16, '94.....82 $\frac{1}{2}$ %
Eagle Phila. list Oct. 16, '94.....82 $\frac{1}{2}$ %
Bay State, list Dec. 23, '95.....90%

Franklin Moore Co.:
Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....82 $\frac{1}{2}$ %
Eclipse, list Dec. 23, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....82 $\frac{1}{2}$ %
Mount Carmel, list Dec. 23, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 23, '99.....80%
Norway Phila., list Oct., '94.....80%
Upon Nut Co.:
Tire Bolts.....72 $\frac{1}{2}$ %

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch.....1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 2
Per doz.....\$4.80 5.60 6.40 8.00
Inch.....1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 2
Per doz.....\$5.65 11.50

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon.....15&10%
Perfection.....40%
Seavey.....33 $\frac{1}{2}$ %
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball American \$1.25@1.30
Barber's.....50&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 125, 207 to 411.....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25&10%
P. S. & W. Co., Peck's Pat. 60&60&5%
Stanley R. & L. Co.:
Stanley.....35%
Victor.....45%

Brackets—

Wrought Steel.....80&10@80&10&5%
Griffin's Pressed Steel.....80&10&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western W. G. Co., Wire.....60&10%

Bright Wire Goods—

See Wire and Wire Goods.

Boilers—

Kilbourne Mfg. Co.....75&20%
Western W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen:
Quart.....19 12 14
Water, Regular.....1.45 1.70 1.90
Water, Heavy.....3.40 3.70 3.80
Fire, Rd. Bottom.....2.30 2.55 2.95
Well.....2.55 2.87 3.15

Bucks, Saw—

Hoosier.....\$ gro. \$36.00

Bull Rings—See Rings, Bull

Butts—Brass—

Wrought, list, Sept., '96. 15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow.....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—

Reversible and Broad 75&5%
Light Reversible, Light Narrow.....75&10%
Loose Joint, Narrow, L'h Inside Blind, etc.....75%
Back Flaps, Table, Chest.....70&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33 $\frac{1}{2}$ %
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 900 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4 $\frac{1}{2}$ @
Sharp, 1 prong.....per lb. 4 $\frac{1}{2}$ @
Burke's Blunt.....40&4%
Burke's Sharp.....4 $\frac{1}{2}$ @4 $\frac{1}{2}$

<p>Can Openers— See <i>Openers, Can.</i></p> <p>Cans, Milk— 5 8 10 gal. Illinois Pattern.....\$1.35 1.85 2.45 each. New York Pattern.....1.50 2.20 2.45 each. Baltimore Pattern.....1.50 2.20 2.45 each. Duquesne.....1.35 1.60 1.75 each.</p> <p>Cans, Oil— Buttalo Family Oil Cans: 3 5 10 gal. \$18.00 60.00 129.60 gro., net.</p> <p>Caps, Percussion— <i>Eley's E. B.</i>.....52@45¢ F. D.....per M 34@35¢ G. L.....per M 40@42¢ G. E.....per M 48@50¢ Musket.....per M 62@63¢</p> <p>Primers— Berdan Primers, \$2 per M.....80% B. L. Caps (Sturtevant Shells).....20% \$2 per M.....20% All other primers per M \$1.50@1.60</p> <p>Cartridges— Blank Cartridges: 32 C. F. \$5.50.....10.65% 38 C. F. \$7.00.....10.65% 22 cal. Rim, \$1.50.....10.65% 32 cal. Rim, \$2.75.....10.65% B. B. Caps, Con. Ball, Suedg. \$1.90 B. B. Caps, Round Ball.....1.49 Central Fire.....25% Target and Sporting Rifle.....15.65% Primed Shells and Bullets.....15.10% Rim Fire, Sporting.....50% Rim Fire, Military.....15.65%</p> <p>Casters— Bed.....70@70¢10% Plate.....60¢10@60¢10.65% Philadelphia.....75¢75¢10% Acme, Ball Bearing.....70¢10% Boss.....70¢10% Boss Anti-Friction.....70¢10% Gess (Holler Bearing).....80% Martin's Patent (Phoenix).....45% Standard Ball Bearing.....45% Tucker's Patent low list.....50% Yale (Double Wheel) low list.....50%</p> <p>Cattle Leaders— See <i>Leaders, Cattle.</i></p> <p>Chain, Coil— American Coil, Straight Link: 5-16 1/4 5-16 3/4 7-16 1/2 9-16 \$8.70 5.90 4.95 4.20 4.05 3.95 3.90 5-16 3/4 7-16 1/2 9-16 1 1/4 1 1/2 inch. \$3.85 3.70 3.65 3.80 German Coil.....60¢10¢10¢70%</p> <p>Halter— Halter Chains.....60¢5¢@60¢10% German Pattern Halter Chains, list July 21, '97.....60¢10¢10% Covert Mfg. Co.....35.65% Covert's Saddlery Works.....70% Halter.....70%</p> <p>Cow Ties— See <i>Halters and Ties.</i></p> <p>Trace, Wagon, &c.— Traces, Western Standard: 100 pr. 6 1/2-6-3, Str'ght, with ring \$26.00 6 1/2-6-2, Str'ght, with ring \$25.00 6 1/2-8-2, Str'ght, with ring \$30.00 6 1/2-10-2, Str'ght, with ring \$35.00 NOTE—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.</p> <p>Eastern Standard Traces, Wag- on Chain, &c.....60¢10% Miscellaneous— Jack Chain, list July 10, '93: Iron.....60¢10¢5¢70% Brass.....60¢10¢60¢10¢10% Safety Chain.....75¢75¢10% Gal. Pump Chain.....1b. 4¢1/4% Covert Mfg. Co.: Breast, Halter, Heel, Rein, Stal- lion.....40% Covert & Co. Works: Breast, Hold Back, Rein.....70% Oneida Community: Am. Dog Leads and Kennel Chains, 40¢10¢5% Niagara Dog Leads and Kennel Chains.....45¢60¢45% Wire Good Co.: Dog Chain.....70¢10% Universal Dbl.-Jointed Chain.....50% Chain and Ribbon, Sash— Oneida Community: Copper Chain.....60¢5% Steel Chain.....60% Pullman: Bronze Chain.....60% Steel Chain.....60¢10% Sash Chain Attachments, per set, B Aluminy Sash Ribbon, per 100 ft.....\$1.25@3.00 Sash Ribbon Attachments, per set, B Chalk— (From Jobbers). Carpenters' Blue.....gro. 38¢10¢4¢ Carpenters' Red.....gro. 33¢10¢35¢ Carpenters' White.....gro. 28¢10¢30¢ See also Crayons.</p> <p>Checks, Door— Bardley's.....45% Eclipse.....60¢10% Pullman, per gro.....\$54.00 Russwin.....40%</p> <p>Chests, Tool— American Tool Chest Co.: Boy's Chests, with Tools.....55% Youths' Chests, with Tools.....40% Gentlemen's Chests, with Tools.....30% Farmers' Carpenters', etc., Chests, with Tools.....\$1.25@3.00 Machinists' and Pipe Fitters' Chests, Empty.....50% Tool Cabinets.....50% C. E. Jennings & Co.'s Machinists' Tool Chests.....33¢4¢10%</p> <p>Chisels— Socket Framing and Framer Standard List.....75¢75¢10%</p>	<p>Black Bros.....40% Charles Buck.....40% C. E. Jennings & Co. Socket Framer No. 10.....60% C. E. Jennings & Co. Socket Fram- ing No. 15.....60% Ohio Tool Co.'s.....75% Swan's.....30¢30¢5% L. & I. J. White.....30¢30¢5% L. & I. J. White, Tanged.....25¢5%</p> <p>Tanged— Tanged Firmers.....33 1/3-3¢10% Buck Bros.....40% Charles Buck.....40% C. E. Jennings & Co. Nos. 191, 181, 25% Cold— 1b. Cold Chisels, good quality, 13¢15¢ Cold Chisels, fair quality, 11¢12¢ Cold Chisels, ordinary.....9¢10¢</p> <p>Chucks— Almond Drill Chucks.....35% Almond Turret Six-Tool Chuck.....35% Beach Pat., each \$8.00.....35.65% Empire.....25% Blacksmiths.....25% Jacobs' Drill Chucks.....35% Pratt's Positive Drive.....25% Skinner Patent Chucks.....40.10% Independent Lathe Chucks.....40.10% Universal, Reversible Jaws.....40% Combination, Reversible Jaws.....40% Drill Chucks, New Model.....25% Drill Chucks, Standard.....40.10% Drill Chuck, Skinner Pat.....35% Drill Chucks, Positive Drive.....35% Planer Chucks.....30% Face Plate Jaws.....40.10% Standard Tool Co.: Improved Drill Chuck.....45% Union Mfg. Co.: Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17.....40% Combination, No. 21.....35% Scroll Combination, Nos. 82 and 84.....30% Geared Scroll, Nos. 33, 34 and 35.....35% Independent Iron, Nos. 18 and 318.....40% Independent Steel, No. 64.....30% Union Gear Drill, Nos. 000, 101, 103.....35% Universal 11, 12, 16, 17, 13, 14, 15, 40 Universal, No. 42.....35% Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....40% Steel Face Plate Jaws, Nos. 70 and 72.....35% Westcott Patent Chucks: Lathe Chucks.....50% Little Giant Auxiliary Drill.....50% Little Giant Double Grip Drill.....50% Little Giant Drill, Improved.....50% Onoda Drill.....50% Scroll Combination Lathe.....50%</p> <p>Clamps— Adjustable, Hammers'.....20¢20¢5% Cabinet, Sargent's.....50¢10% Carriage Makers'.....P. S. & W Co.....40¢10¢50% Carriage Makers', Sargent's.....60% Besly, Parallel.....33¢10% Lipman's, Utica Drop Forge & Tool Co.....40% Wood Workers'.....40.10% Saw Clamps, see <i>Vises, Saw Filers.</i></p> <p>Cleaners, Drain— Iwan's Champion, Adjustable.....55% Iwan's Champion, Stationary.....4%</p> <p>Sidewalk— Star Socket, All Steel.....\$1 doz. \$4.05 net Star Shank, All Steel.....\$1 doz. \$3.24 net W. & C. Shank, All Steel.....\$1 doz. 7 1/4 in. \$3.00; 8 in. \$3.25.</p> <p>Cleavers, Butchers'— Foster Bros.....30% New Haven Edge Tool Co.'s.....45% Fayette R. Plumb.....40% L. & I. J. White.....30%</p> <p>Clippers, Horse and Sheep— Chicago Flexible Shaft Company: 98 Chicago Horse, each.....\$5.75 1902 Chicago Horse, each.....\$10.75 20th Century Horse, each.....\$5.00 Lightning Belt Horse, each \$15.00 Chicago Belt Horse, each \$20.00 Stewart's Enclosed Gear Horse, each.....\$6.75 Stewart's Patent Sheep Shear- ing Machine, each.....\$12.75</p> <p>Clips, Axle— Regular Styles, list July 1, '05 80% Cloth and Netting, Wire —See <i>Wire, &c.</i></p> <p>Cocks, Brass— Hardware list: Compression, Plain Ribbs, Globe, Kerosene, Racking, &c., Cocks.....75¢75¢4%</p> <p>Coffee Mills— See <i>Mills, Coffee.</i></p> <p>Collars, Dog— Nickel Chain, Walter B. Stevens & Son's list.....40% Leather, Walter B. Stevens & Son's list.....40%</p> <p>Combs, Curry— Metal Stamping Co.....40%</p> <p>Mane and Tail— Covert's Saddlery Works.....60¢10%</p> <p>Compasses, Dividers, &c. Ordinary Goods.....75¢5¢75¢10% Bemis & Call Hdw. & Tool Co.: Dividers.....65% Calipers, Double.....65% Calipers, Inside or Outside.....65% Calipers, Winding.....65% Compasses.....50% Wm. Schollhorn Co.: Excelsior Dividers.....60% Lodi Dividers.....75%</p> <p>Conductor Pipe,— L. C. L. to Dealers: Territory: Galvanized Galv. Charcoal Steel. Iron. Copper. Eastern: 70¢10 % 60¢7 1/2 % 50 % Central: 70¢2 1/2 % 60 % 40¢10¢5 % Western and S. W.: 65¢10 % 50¢10¢2 1/2 % 47 1/2 %</p>	<p>So. Western 62 1/2¢7 1/2 % 50¢5 % 40¢10 % Copper.....14¢16 oz. Eastern.....50¢10 % Central.....50¢7 1/2 % Southern.....50¢5 % So. Western.....50¢2 1/2 % Terms, 60 days; 2% cash 10 days. Fac- tory shipments generally delivered. See also <i>Eave T</i></p>
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No. 21.....
No. 22.....
Copper.....

Elbows, Stove Pipe—

Dover, one piece.....
Perfect Elbows (R. M. Co.).....

Emery, Turkish—

4 to 50 5 1/2 to 220 Flour.....
Kegs.....
1/2 Kegs.....
1/4 Kegs.....
10-lb. cans.....
10 in case.....
10-lb. cans, less.....
than 10.....
Less quantity.....
NOTE—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's.....
Walling's.....

Cord and Weight—

Ives.....

Faucets—

Cork Lined.....
Metallic Key; Leather Lined.....
Red Cedar.....
Petroleum.....
B. & L. Co. Co.....
Star.....
West Lock.....
John Sommer's Peerless Tin Key.....
John Sommer's Boss Tin Key.....
John Sommer's Victor M. Key.....
John Sommer's Duplex Metal Key.....
John Sommer's Diamond Lock.....
John Sommer's I. X. L. Cork Lined.....
John Sommer's Reliable Cork Lined.....
John Sommer's Chicago Cork Lined.....
John Sommer's O. K. Cork Lined.....
John Sommer's No Brand, Cedar.....
John Sommer's Perfection, Cedar.....
McKenna, Brass.....
Burglar Proof, N. P.....
Improved, 1/2 and 3/4 inch.....
Self Measuring.....
Enterprise, 1/2 doz.....
Lane's, 3/4 doz.....
National Measuring, 1/2 doz.....

Felloe Plates—

—See Plates, Felloe.

Files—Domestic—

List revised Nov. 1, 1899.

Best Brands.....
Standard Brands.....
Lower Grade.....

Imported—

Stubs' Tapers, Stubs' list, July 21, '97.....
Fixtures, Fire Door.....
Richards Mfg. Co.....
Universal, No. 103.....
Special, No. 104.....
Fusible Links, No. 96.....
Expansion Bolts, No. 107.....

Grindstone—

Net Prices:.....
Inch.....
Per doz.....
P. S. & W. Co.....
Reading Hardware Co.....
Sargent's.....
Stowell's Giant Grindstone Hanger.....
Stowell's Grindstone Fixtures, Extra.....
Stowell's Grindstone Fixtures, Light.....
Fodder Squeezers—
See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....
Victor, Hay.....
Victor, Manure.....
Victor, Header.....
Champion, Hay.....
Champion, Header.....
Champion, Manure.....
Columbia, Hay.....
Columbia, Header.....
Columbia, Spading.....
Hawkeye Wood Barley.....
W. & C. Potato Digger.....
Acme Hay.....
Acme Manure, 4 line.....
Dakota Header.....
Jackson Steel Barley.....
Kansas Header.....
W. & C. Favorite Wood Barley.....
Plated.—See Spoons.

Frames—Saw—

White, 8'x7' Bar, per doz.....
Red, 8'x7' Bar, per doz.....
Red, Dbl. Brace, per doz.....

Freezers, Ice Cream—

Qt.....
Each.....

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse—

Per 1000 Feet.....
Hemp.....
Cotton.....
Waterproof Sgt. Taped.....
Waterproof Dbl. Taped.....
Waterproof Tpl. Taped.....

Gates, Molasses and Oil—

Stebbins' Pattern.....

Gauges—

Marking, Mortise, &c.....
Chapin-Stephens Co.....
Marking, Mortise, &c.....
Schell's Patent.....
Door Hangers.....

Stanley R. & L. Co.'s Butt and Rabbit Gauge.....
Marking and Mortise.....
Wire, Brown & Sharpe's.....
Wire, Morse's.....
Wire, P. S. & W. Co.....

Gimlets—Single Cut—

Numbered assortments, per gro.....

Nail, Metal, No. 1, \$2.00; 2, \$2.30.....
Spike, Metal, No. 1, \$4.00; 2, \$4.30.....
Nail, Wood Handled, No. 1, \$2.50; 2, \$2.60.....
Spike, Wood Handled, No. 1, \$4.50; 2, \$4.60.....

Glass, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co.....

Glue, Liquid Fish—

Bottles or Cans, with Brush.....

International Glue Co. (Martin's).....

Grease, Axle—

Common Grade.....
Dixon's Everlasting, 10-lb pails, ea.....
Dixon's Everlasting, in boxes, 1 doz.....
1 lb, \$1.20; 2 lb, \$2.00.....
Helmet Hard Oil.....

Griddles, Soapstone—

Pike Mfg. Co.....

Grindstones—

Bicycle Emery Grinder.....
Bicycle Grindstones, each.....
Pike Mfg. Co.....
Improved Family Grindstones, per inch, 1/2 doz.....
Pike Mower and Tool Grinder, each.....
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....

Grips, Nipple—

Perfect Nipple Grips.....

Halters and Ties—

Cow Ties.....
Covert Mfg. Co.....
Web.....
Jute Rope.....
Sisal Rope.....
Cotton Rope.....
Hemp Rope.....
Covert's Saddlery Works.....
Web and Leather Halters.....
Jute and Manila Rope Halters.....
Sisal Rope Halters.....
Jute, Manila and Cotton Rope Ties.....
Sisal Rope Ties.....
Onedra Community.....
Am. Coil and Halters.....
Am. Cow Ties.....
Niagara Coil and Halters.....
Niagara Cow Ties.....
E. T. Russ & Co.....
Leather Halters.....
Web Halters and Walvins.....
Jute and Sisal Rope Halters.....
Jute and Sisal Horse and Cattle Ties.....
Cotton Horse Ties.....
Livery Ties, Braided.....

Hammers—

Handled Hammers—
Heller's Machinists'.....
Heller's Farriers'.....
Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75.....
Peck, Stow & Wilcox, Steel.....
Fayette H. Plumb.....
Plumb, A. E. Nail.....
Engineers' and R. S. Hand.....
Machinists' Hammers.....
Riveting and Timbers.....
Sargent's C. S. New List.....

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢.....
3 to 5 lb., per lb., 40¢.....
Over 5 lb., per lb., 30¢.....
Wilkinson's Smiths'.....

Handles—

Agricultural Tool Handles
Axe, Pick, &c.....
Hoe, Rake, &c.....
Fork, Shovel, Spade, &c.....
Long Handles.....
D Handles.....

Cross-Cut Saw Handles—

Atkins.....
Champion.....
Dixson's.....

Mechanics' Tool Handles—

Auger, assorted.....
Brad Axl.....
Chisel Handles.....
Apple Tanged Firmer, gro.....
Hickory Tanged Firmer, gro.....
Apple Socket Firmer, gro.....
Hickory Socket Firmer, gro.....
Hickory Socket Framing, gro.....
File, assorted.....
Hammer, Hatchet, &c.....
Hand Saw, Varnished, doz.....
80¢ & 85¢; Not Varnished.....
Plane Handles:
Jack, doz.....
Fore, doz.....
Chapin-Stephens Co.....
Carving Tool.....
Chisel.....
File and Awl.....
Saw and Plane.....
Screw Driver.....
Mills Falls Adj. and Hatchet Auger Handles.....
Nicholson Simplicity File Handle.....

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1.....
Reliable, No. 2.....
Chicago Spring Butt Co.:
Friction.....
Osculating.....
Big Twin.....
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....
Elevator.....
Railroad.....
Crouk & Carrier Mfg. Co.:
Loose Axle.....
Roller Bearing.....
Griffin Mfg. Co.:
Solid Axle, No. 10.....
Roller Bearing, No. 11.....
Roller Bearing, Ex. Hy., No. 2.....
Hinged Hangers, \$16.00.....
Lane Bros. Co.:
Parlor, Ball Bearing.....
Parlor, Standard.....
Parlor, No. 103.....
Parlor, New Model.....
Parlor, New (Champion).....
Barn Door, Standard.....
Hinged.....
Covered.....
Special.....
Lawrence Bros.:
Advance.....
Clipper, No. 75.....
Crown.....
Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25.....
Giant.....
Hummer.....
New York.....
Peerless.....
Sterling.....
McKinney Mfg. Co.:
No. 1, Special.....
No. 2, Standard.....
Hinged Hangers.....
Meyers' Stayon Hangers.....
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 117, 247.....
Pioneer Wood Track No. 3.....
Ball B'g St'l Track No. 10.....
Roller B'g St'l Track No. 12.....
Ball B'g St'l Track No. 13.....
Roller B'g, Nos. 39, 45, 70.....
Hero, Adj. Track No. 19.....
Adjustable Track Tandem Trolley Track No. 16.....
Seal, Steel Track No. 8.....
Auto Adj. Track No. 22.....
Trolley B. D. No. 17.....
Trolley F. D. No. 120.....
Trolley F. D. No. 121.....
Trolley F. D. No. 150.....
Safety Underwriters F. D. No. 101.....
Tandem No. 44.....
Palace, Adjustable Track No. 122.....
Royal, Adjustable Track No. 122.....
Ives' Wood Track No. 1.....
Trolley B. D. No. 20.....
Trolley B. D. No. 21.....
Trolley B. D. No. 27.....
Trolley B. D. No. 28.....
Roller Bearings, No. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.....
Anti-friction, No. 42.....
Anti-friction, No. 44, Sizes 2 1/2 and 3.....
Hinged Tandem No. 48.....
Folding Door B. B. Swivel No. 135.....
Safety Door Hanger Co.:
Storm King Safety.....
U. S. Standard Hinge.....
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing.....
Ajax Hinge Door.....
Apex Parlor Door.....
Atlas.....
Baggage Car Door.....
Climax Anti-Friction.....
Elevator.....
Express.....
Freight Car Door.....
Interstate.....
Lundy Parlor Door.....
Magic.....
Matchless.....
Nansen.....
Parlor Door.....
Railroad.....
Rex Hinge Door.....
Street Car Door.....
Steel, Nos. 300, 404, 500.....
Underwriters' Fire Door.....
Wild West Warehouse Door.....
Zenith Wood Track.....
A. L. Sweet Iron Works:
Check Back.....
Climax Anti-Friction.....
Eagle.....
Hylo Hinge.....
New Perfection.....
Pilot.....
Pilot Hinge.....
Rider Woooster.....
Western Pattern.....
Taylor & Boggs F'y Co.'s Kidder's Roller Bearing.....

Hangers—Garment—

Pullman Trouser, 1/2 gro, 1 pair Flat Aluminizing.....
\$2.00; 1 pair Round Nickleled, \$2.00; 1 pair Flat Gun Metal, \$2.00; 1 pair Flat Black Enameled, \$2.50; 1 pair Wood Clamp, \$13.00; Skirt Hangers, Folding, per gro, \$21.00; Coat Hangers, Folding, per gro, \$8.00; Garment Hanger Rods, Round Nickleled, per gro, \$15.00; Garment Hanger, Loops, Round Nickleled, per gro, \$15.00; Victor Folding.....
Western, W. G. Co.....

Gate—

Myers' Patent Gate Hangers, 1/2 doz, net.....

Joist and Timber—

Lane Bros. Co.....

Hasps—

Griffin's Security Hasp.....
McKinney's Perfect Hasp, 1/2 doz.....

Hatchets—

Regular list, first quality.....
Second quality \$1.00 per doz, less than first quality.

Heaters, Carriage—

Clark, No. 5, \$1.75; No. 5B, \$2.00; No. 3, \$2.25; No. 3D, \$2.75; No. 7D, \$3.00; No. 3E, \$3.25; No. 1, \$3.50.....
Clark Coal, 1/2 doz.....

Hinges—

Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)
No.....
Doz, pair.....
Mortise Shutter: (L. & P. O. S., Dixie, &c.)
No.....
Doz, pair.....
Mortise Reversible Shutter (Buffalo, &c.):
No.....
Doz, pair.....
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....
Charles Parker Co.....
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....
Hale's Blind Awning Hinges, No. 110, for wood, \$9.00; No. 111, for brick, \$9.00.....
Reading's Gravity.....
Sargent's, Nos. 1, 3, 11 and 13.....
Stanley's Steel Gravity Blind Hinges, 1/2 doz, sets, without screws, \$9.90; with screws, \$1.20.....
Wrightsville Hardware Co.:
O. S., Lull & Porter.....
Acme, Lull & Porter.....
Queen City Reversible.....
Shepard's Noiseless, Nos. 60, 65, 55.....
Niagara, Gravity Locking, Nos. 1, 3 & 5.....
1868, Old Pat'n, Nos. 1, 3 & 5.....
Tip Pat'n, Nos. 1, 3 & 5.....
Buffalo, Gravity Locking, Nos. 1, 3 & 5.....
Shepard's Double Locking, Nos. 20 & 25.....
Champion Gravity Locking, No. 10.....
Steamboat Gravity Locking, No. 10.....
Pioneer, Nos. 080, 45 & 5 1/2.....
Empire, Nos. 101 & 103.....
W. H. Co.'s Mortise Gravity Locking, No. 2.....

Gate Hinges—

Clark's or Shepard's—Doz. sets:
No.....
Hinges with Latches.....
Hinges only.....
Latches only.....
New England:
With Latch.....
Without Latch.....
Reversible Self-Closing:
With Latch.....
Without Latch.....
Western:
With Latch.....
Without Latch.....
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets, No. 1.....
Hinges with Latches.....
Hinges only.....
Latches only.....

Pivot Hinges—

Bommer Bros. Pivot.....
Lawson Mfg. Co. Matchless.....

Spring Hinges—

Holdback, Cast Iron.....
Non-Holdback, Cast Iron.....
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....
Bardsley's Patent Checking.....
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....
Bommer Spring Hinges.....
No. 999 Wrot, Steel Hold Back.....
Chicago Spring Butt Co.:
Chicago Spring Hinges.....
Triple End Spring Hinges.....
Chicago (Ball Bearing) Floor Hinge.....
Garden City Engine House.....
Keene's Saloon Door.....
Columbia Hardware Co.:
Acme, Wrought Steel.....
Acme, Brass.....
American.....
Columbia, No. 14.....
Columbia, No. 18.....
Columbia, Adjustable, No. 7.....
Gem, new list.....
Clover Leaf.....
Oxford, new list.....
Lawson Mfg. Co. Matchless.....
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....
Ball Bearing Floor Hinge.....
Ohio Detachable Screen Door Hinge.....
Superior Spring Hinge Co.:
Superior Floor Hinges.....
The Stover Mfg. Co.:
Ideal, No. 16, Detachable.....
Ideal, No. 4.....
New Idea No. 1.....
New Idea Double Acting.....
New Idea Floor.....
Van Wagener:
Ball Bearing.....
No. 777 Sh't Steel Holdb'k.....

Extra 10% often given.

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list
December 20, 1904:

Light Strap Hinges.....65%	
Heavy Strap Hinges.....75%	
Light T Hinges.....60%	
Heavy T Hinges.....55%	
Extra Heavy T Hinges.....70%	
Hinge Hasps.....45%	
Cor. Heavy Strap.....75%	
Cor. Ex. Heavy T.....70%	

Screw Hook { 6 to 12 in. 1b. 3 3/4¢	
and Strap. { 1 1/2 to 20 in. 1b. 3 3/4¢	
{ 22 to 36 in. 1b. 3 3/4¢	

Screw Hook and Eye:	
1/2 to 1 inch.....1b. 6 1/4¢	
1 1/2 inch.....1b. 7 1/4¢	
2 inch.....1b. 8 1/4¢	

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers.....30&2%**Hods— Coal—**
Per doz.

Inch.....15 16 17 18	
Galv. Open.....\$2.50 2.75 3.00 3.25	
Jap. Open.....\$1.90 2.10 2.25 2.55	
Galv. Funnel.....\$3.00 3.30 3.60 3.90	
Jap. Funnel.....\$2.45 2.65 2.85 3.30	

Masons' Etc.—
Cleveland Wire Spring Co.:

Steel Brick, No. 162.....each \$0.95	
Steel Mortar, No. 158.....each \$1.25	

Hoes— Eye—
Scovill and Oval Pattern.....

60&100&60&100&10%	
Grub, list Feb. 23, 1899.....	
70&100&75&10%	
D. & H. Scovill.....33&4%	

Handled—
NOTE.—Manufacturers are selling

from the list of September 1, 1904, but many jobbers are still using list of August 1, 1900, or selling at net prices.

Cronk's Weeding No. 1, \$2.00; No. 2, \$2.25	
Ft. Madison Cotton Hoe.....70&10%	
Ft. Madison Crescent Cultivator Hoe.....	
doz.....70&10%	
Ft. Madison Mattock Hoe:	

Regular Weight.....doz. 66%	
Junior Size.....doz. \$4.00	
Ft. Madison Sprouting Hoe.....doz. 50%	
Ft. Madison Dixie Tobacco Hoe.....	
75&100&75&10%	

Kretschmer's Cut Easy.....70&10%	
Warner Hoe.....45&10%	
W. & C. Ivanhoe.....75&10%	
B. H. 6 in. Cultivator Hoe.....33 1/3	
B. H. 6 1/2 in. Cultivator Hoe.....33 1/3	
Acme Wedging.....doz. \$4.25	
W. & C. L. tuning Shuffle Hoe, doz. \$4.85	

Hoisting Apparatus—
See Machines, Hoisting.**Holders— Bit—**
Angular, 1/2 doz. \$24.00.....45&10%**Door—**
Bardsley's.....45%

Empire.....50%	
Pullman.....50%	
Superior.....33&4%	

File and Tool—
Nicholson File Holders and File

Handles.....33&40%	
Triumph Fruit Jar Holder, 1/2 gross,	
\$10.80; 1/2 doz.....\$1.25	

Hones—Razor—
Pike Mfg. Co., Belgian, German and

Sway.....50%	
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Hooks—Cast Iron—
Bird Cage, Reading.....40%

Bird Cage, Sargent's List, Nos. 32,	
33, 129, 132, 133 and 135.....50&10%	
Clothes Line, Reading List.....40%	
Clothes Line, Sargent's List.....50&10%	
Coat and Hat, Sargent's List.....50&10%	
Clothes Line, Stowell's.....70%	
Coat and Hat, Reading.....45&20%	
Coat and Hat, Stowell's.....70%	
Coat and Hat, Wrightsville.....65%	
Harness, Reading List.....40%	
Harness, Stowell's.....60%	
School House, Stowell's.....70%	

Wire—
Belt.....80&100%.

Wire C. & H. Hooks.....%	
75&100&75&10&10%	
Columbian Hdw Co., Gem.....70&10%	
Parker Wire Goods Co., King.....70&10%	
Van Wagoner, Coat and Hat.....70%	
Western W. G. Co. Molding.....75%	
Wire Goods Co.:	

Acme.....60&10%	
Chief.....70%	
Crown.....75%	
Czar.....65%	
V Brace.....75%	
Czar Harness.....50&10%	

Wrought Iron—
Box, 6 in., per doz., \$1.00; 8 in.,

\$1.25; 10 in., \$3.50.	
Cotton.....doz. \$1.05&\$1.25	
Wrought Staples, Hooks, &c.....	

Miscellaneous—
Hooks, Bench, See Staps, Bench.

Bush, Light, doz. \$1.75; Medium,	
\$5.35; Heavy, \$6.25	
Grass, best, all sizes, per doz. \$1.60	
Grass, common grades, all sizes,	
per doz.....\$1.30	
Whiffletree.....1b. 5 1/4¢&6¢	

Hooks and Eyes:
Brass.....60&50&60&10&5%

Malleable Iron.....70&70&10%	
Covert Mfg. Co. Gate and Scuttle	
Hooks.....90%	
Covert Saddlery Works' Self Locking	
Gate and Door Hook.....60%	
Ft. Madison Cut-Easy Corn Hooks,	
doz. \$3.25 net	

Bench Hooks—See Bench Staps.
Corn Hooks—See Knives, Corn.**Horse Nails—**
See Nail's, Horse.**Horseshoes—**
See Shoes, Horses.**Hose, Rubber—**
Garden Hose, 1/4-inch:

Competition.....ft. 5 @ 6¢	
3-ply Guaranteed.....ft. 8 @ 9¢	
4-ply Guaranteed.....ft. 10 @ 11¢	
Cotton Garden, 1/4-in., coupled:	
Low Grade.....ft. 8 @ 9¢	
Fair Quality.....ft. 10 @ 11¢	

Iron— Sad—
From 1 to 10.....1b. 3 @ 3 1/4¢

B. B. Sad Irons.....1b. 3 1/4 @ 3 1/2¢	
Mrs. Potts', cents per set:	
Nos.....50 55 60 65	
Jap'd Tops.....63 65 78 75	
Tin'd Tops.....71 68 81 78	
New England Pressing 1b. 3 1/4 @ 1 1/2¢	

Pinking—
Pinking Irons.....doz. 60¢**Iron, Soldering**
See Coppers.**Jacks, Wagon—**
Covert Mfg. Co.:

Auto Screw.....30&2%	
Steel.....45%	
Covert's Saddlery Works:	
Doz.....60&10%	
Victor.....50%	
Lockport.....30&10&2%	
Lane's Steel.....30&10&2%	
Richards' Tiger Steel, No. 130.....50&10%	
Smith & Hemenway Co.'s.....25%	

Kettles—
Brass, Spun, Plain.....20&25%

Enameled and Cast Iron—See Ware,	
Hollow.....	

Knives—
Butcher, Kitchen, &c.—

Foster Bros' Butcher, &c.....30%	
Wilkinson Shear & Cutlery Co.....60%	

Corn—
Wilkinson Wilcut Brand Knives and

Hooks.....60%	
Whittington Acme, 1/2 doz. \$2.60	
Dent, \$2.75; Ad. Serrated, \$2.20	
Serrated, \$2.10; Yankee No. 1, \$1.50	
Yankee No. 2, \$1.15	

Drawing—
Standard List.....75&75&10%

C. E. Jennings & Co., Nos. 45, 46, 60	
Jennings & Griffin, Nos. 41, 42.....60%	
Ohio Tool Co.'s.....70%	
Swan's.....75%	
Watrous.....16%	
L. & J. White.....20&5&2%	

Hay and Straw—
Serrated Edge, per doz. \$5.75 to \$6.00

Ivan's Sickle Edge.....doz. \$9.50	
Ivan's Serrated.....doz. \$10.00	

Mincing—
Buffalo.....1/2 gro. \$13.00

Miscellaneous	
Farriers'.....doz. \$3.00&\$3.25	
Wostenholm's.....doz. \$3.00&3.25	

Knobs—
Base, 2 1/2-inch, Birch, or Maple,

Rubber Tip.....1/2 gro. \$1.25&\$1.50	
Carriage, Jap., all sizes.....	
40&45¢	

Door, Mineral.....doz. 65¢&70¢	
Door, Por. Jap'd.....doz. 70¢&75¢	
Door, Por. Nickel.....doz. \$2.05&\$2.15	
Bardsley's Wood Door, Shutters, &c.....	
Picture, Sargent's.....60&10&10%	

Lacing, Leather—
See Belting, Leather.**Ladders, Store, &c.—**
Lane's Store.....25%

Myers' Noiseless Store Ladders.....50%	
Richards Mfg. Co.:	
Improved Noiseless, No. 112.....50%	
Climax Shelf, No. 113.....50%	
Trolley, No. 109.....50%	

Ladies, Melting—
L. & G. Mfg. Co. (low list).....25%

P. S. & W.....50%	
Reading.....60%	
Sargent's.....50&10%	

Lanterns—Tubular—
Regular Tubular, No. 0.....

doz. \$4.25&\$4.50	
Lift Tubular, No. 0.....	
doz. \$4.75&\$5.00	
Hinge Tubular, No. 0.....	
doz. \$4.75&\$5.00	

Other Styles.....40&10&5%
Bull's Eye Police—

No. 1, 2 1/4-inch.....\$2.75&\$3.00	
No. 2, 3-inch.....\$3.00&\$3.25	

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%

Stowell's Badger, Cast Iron.....50%	
Latches—Thumb—	
Roggin's Latches, with screw.....	
doz. 35¢&40¢	

Door—
Cronk & Carrier Mfg. Co., No. 101,

doz. \$2.30	
Cronk & Carrier Mfg. Co., Latch,	
Hasp and Staples.....50%	
Richards' Bull Dog, Heavy, No.	
125.....50&5%	
Richards' Trump, No. 127.....\$1.50	

Leaders, Cattle—
Small.....doz. 50¢; large, 60¢

Covert Mfg. Co.:	
Cotton, Hemp and Jute, 45%;	
Sisal, 33 1/2%.	

Lifters, Transom—
R. & E.....33&4%**Lines—**
Wire Clothes, Nos. 18 19 20

100 feet.....\$2.25 2.00 1.75	
75 feet.....\$1.75 1.35 1.10	
Anniston Waterproof Clothes, 50 ft.,	
1/2 gro. \$25.00; Gilt Edge, \$23.00; Air	
Line, \$23.00; Acme, \$18.00; Alabama, *	
\$17.00; Empire, \$16.00; Advance,	
\$14.00; Eclipse, \$13.50; Chicago,	
\$11.50; Standard, \$10.50; Columbia,	
\$9.50; Alleton, \$13.50; Calhoun, \$12.00.	
Samson Cordage Works:	
Solid Braided Chalk, Nos. 0 to 3, 40%	

Silver Lake Braided Chalk, No. 0,

\$6.00; No. 1, \$6.50; No. 2, \$7.00; No.	
3, \$7.50.....\$7.50	
Masons' Lines, Shade Cord, &c.:	
White Cotton, No. 3 1/2, \$1.50; No. 4,	
\$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2,	
\$1.50; No. 4, \$2.25; No. 4 1/2, \$2.75;	
Linen, No. 3 1/2, \$2.50; No. 4, \$3.50;	
No. 4 1/2, \$4.50.....20%	
Tent and Awning Lines: No. 5,	
White Cotton, \$7.50; Drab Cotton,	
\$8.50.....20%	
Clothes Lines, White Cotton: 50 ft.,	
\$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75	
ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;	
100 ft., \$5.25.....20%	

Locks— Cabinet—
Cabinet Locks.....\$3 1/2 @ \$3 1/4 & 7 1/4%

Door Locks, Latches, &c.—	
NOTE.—Net Prices are very often made	
on these goods.	
Reading Hardware Co.....40%	
R. & E. Mfg. Co.....40%	
Sargent & Co.....40&10%	
Stowell's Steel Door Latches.....50%	

Elevator—
Stowell's.....%**Padlocks—**
Wrought Iron.....75&10&5&80&8%

Net prices are general.	
R. & E. Mfg. Co. Wrought Steel and	
Brass.....75&10%	

Sash, &c.—
Ives' Patent:

Bronze and Brass.....62 1/2%	
Crescent.....50&10%	
Iron.....62 1/2%	
Window Ventilating.....60%	
Robison Patent Ventilating Sash	
Lock.....40%	
Wrought Steel.....55%	
Pullman Patent Ventilating Lock.....25%	
Reading.....40%	

Machines—Boring—
Com. Up'r, without Augers.....\$2.00

Com. Ang'r, without Augers.....\$2.25	
Swan's Improved.....40&10%	
Angular.....	
Jennings' Nos. 1 and 4.....35&5%	
Miller's Falls.....5 1/2%	
Snell's, Rice's Pat. 2 1/2 doz. 2 1/2%	

Corking—
Reisinger Invinible Hand Power.....1/2 doz. \$48.00**Fence—**
Williams' Fence Machines.....each, \$5.50**Hoisting—**
Moore's Anti-Friction Differential

Pulley Block.....30%	
Moore's Hand Hoist, with Lock	
Brake.....20%	

Ice Cutting—
Chandler's.....12 1/4%**Washing—**
Boss Washing Machine Co.: Per doz.

Boss No. 1.....\$57.00	
Boss Rotary.....\$54.00	
Champion Rotary Bapier No. 1.....\$54.00	
Standard Champion No. 1.....\$48.00	
Standard Perfection.....\$36.00	
Cintl Square Western.....\$30.00	
Uneda American, Round.....\$30.00	

Mallets—
Hickory.....45&50%

Lignumvite.....45&50%	
Tinners' Hickory and Apple-	
wood.....doz. 45&50%	

Mangers, Stable—
Swett Iron Works.....50%**Mashers, Vegetable—**
Western W. G. Co., Potato.....60&10%**Mats, Door—**
Elastic Steel (W. G. Co.), new list.....

50&10%	
Keystone Wire Matting Co.:	
Keystone.....50%	
Ideal.....50%	

Mattocks—
See Picks and Mattocks.**Milk Cans—See Cans, Milk.**
Mills, Coffee, &c.—

Enterprise Mfg. Co.....25&30%	
National list Jan. 1, 1902.....30%	
Parker's Columbia & Victoria.....50&10&60%	
Parker's Box and Slide.....50&10&60%	
Swift, Lane Bros. Co.....30%	

Mowers, Lawn—
NOTE.—Net prices are generally quoted

Chapcut.....all sizes, \$1.85&\$2.50	
Cheap.....all sizes, \$2.00&\$2.50	
Better Grade.....all sizes, \$2.50&\$4.50	
12 1 1/2 16 18-in.	

Chapeau.....all sizes,	\$1.85@2.00
Cheap .....all sizes,	\$2.00@2.50
Better Grade..all sizes,	\$2.50@4.50

Parers—Apple—

Advance	doz.	\$4.00
Baldwin	doz.	\$4.00
Bonanza Improved	each	\$6.50
Daisy	doz.	\$4.00
Dandy	doz.	\$7.50
Eureka Improved	each	\$20.00
Family Bay State	doz.	\$15.00
Improved Bay State	doz.	\$26.00
Little Star	doz.	\$5.00
New Lightning	doz.	\$7.00
Reading 72	doz.	\$3.25
Reading 78	doz.	\$6.25
Rocking Table	doz.	\$6.25
Turn Table	doz.	\$6.00
White Mountain	doz.	\$5.00

Potato—

Saratoga	doz.	\$7.00
White Mountain	doz.	\$6.00

Picks and Mattocks—

List Feb. 23, 1899.....	75%
Cronk's Handled Garden Mattock,	
3 doz., \$6.40.....	33½%

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass	60@60&10%
Iron, list Nov. 11, '85	60@60&10%

Pipe, Cast Iron Soil—

Carload lots.

Standard, 2-6 in.	50&10@50&10&5%
Extra Heavy, 2-6 in.	55&10
Fittings	70&10@70&10&5%

Pipe, Merchant—

Consumers, Carloads.

	Blk.	Galv.	Blk.	Galv.
1/8 & 1/4 in.	71%	55%	68%	52%
3/8 in.	73%	59%	70%	56%
1/2 in.	75%	63%	72%	60%
3/4 to 6 in.	79%	69%	76 1/2%	66 1/2%
7 to 12 in.	74%	59%	71 1/2%	56%

Jute	45%
Sisal	33 1/2%
Covert Saddle	60 1/2%
Rulers, Desk—	
Stimpson & Son	30 1/2%
Boxwood and Maple	30 1/2%
Rules	
Boxwood	60 1/2%
Ivory	35 1/2%
Chapin-Stephens Co.:	
Boxwood	60 1/2%
Flexfold	27 1/2%
Ivory	35 1/2%
Miscellaneous	50 1/2%
Combination	55 1/2%
Stationers	10 1/2%
Keuffel & Esser Co.:	
Folding, Wood	35 1/2%
Folding, Steel	33 1/2%
Lufkin's Steel	50 1/2%
Lufkin's Lumber	60%
Stanley R. & L. Co.:	
Boxwood	62 1/2%
Ivory	45%
Miscellaneous	45%
Zig Zag	40%
Zig Zag, Pin Joint	42 1/2%
Upson Nut Co.:	
Boxwood	60 1/2%
Ivory	35 1/2%
Sash Balances—	
See Balance, Sash.	
Sash Locks—	
See Locks, Sash.	
Sash Weights—	
See Weights, Sash.	
Sausage Stuffers or Fillers	
See Stuffers or Fillers, Sausage.	
Saw Frames—	
See Frames, Saw.	
Saw Sets—	
See Sets, Saw.	
Saw Tools—	
See Tools, Saw.	
Saws—	
Atkins':	
Circular	50%
Band	50 1/2%
Cross Cuts	35 1/2%
Mulay, Mill and Drag	50%
One-Man Saw	40%
Wood Saws	40%
Hand, Compass, &c.	40%
Chapin-Stephens Co.:	
Turning Saws and Frames	30 1/2%
Diamond Saw Stamping Tools	30 1/2%
Sterling Kitchen Saws	30 1/2%
Disston's:	
Circular, Solid and Ins'ted Tooth	50%
Band, 2 to 14 in. wide	60%
Band, 1/4 to 1 1/2	60%
Crosscuts	50%
Narrow Crosscuts	50%
Mulay, Mill and Drag	50%
Framed Woodsaws	35%
Woodsaw Blades	35%
Woodsaw Rods	25%
Hand Saws, Nos. 12, 99, 9, 16, 4100	25%
10, 120, 76, 7, 3, 107, 107 1/2, 3, 1	25%
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1	25%
0, 00, Combination	30%
Compass, Key Hole, &c.	25%
Butcher Saws and Blades	35%
C. E. Jennings & Co.:	
Back Saws	25%
Butcher Saws	30%
Compass and Key Hole Saws	35%
Framed Wood Saws	30%
Hand Saws	20 1/2%
Wood Saw Blades	35%
Millers Falls:	
Butcher Saws	15 1/2%
Star Saw Blades	15 1/2%
Peace & Richardson's Hand Saws	30%
Simonds':	
Circular Saws	50%
Crescent Ground Cross Cut Saws	35%
One-Man Cross Cuts	40 1/2%
Gang Mill, Mulay and Drag Saws	50%
Band Saws	50%
Back Saws	25 1/2%
Butcher Saws	35 1/2%
Hand Saws	25 1/2%
Hand Saw Bay State Brand	45%
Compass, Key Hole, &c.	25 1/2%
Wood Saws	35 1/2%
Springfield Mach. Screw Co.:	
Diamond Kitchen Saws	40 1/2%
Butcher Saw Blades	35 1/2%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws	50%
Hack Saws—	
Atkins' Hack Saw Blades A A A	25%
Disston's:	
Concave Blades	25%
Keystone	30%
Hack Saw Frames	30%
Fitchburg File Works, The Best	35%
C. E. Jennings & Co.:	
Hack Saw Frames, Nos. 175, 180	40 1/2%
Hack Saws, Nos. 175, 180, complete	40 1/2%
Goodell's Hack Saw Blades	40%
Griffin's Hack Saw Frames	35 1/2%
Griffin's Hack Saw Blades	35 1/2%
Springfield Mach. Screw Co.:	
Diamond Hack Saw Blades	35%
Diamond Hack Saw Frames	50%
Star Hack Saws and Blades	15 1/2%
Sterling Hack Saw Blades	30 1/2%
Sterling Hack Saw Frames	30 1/2%
Sterling Power Hack Saw Machines	10%
each, No. 1, \$25.00; No. 2, \$30.00	10%
Victor Hack Saw Blades	25%
Victor Hack Saw Frames	40%
Scroll—	
Barnes' No. 7	25%
Barnes' Scroll Saw Blades	40%
Barnes' Velocipede Power Scroll Saw	40%
without boring attachment, \$18	40%
with boring attachment, \$20	40%
Lester, complete, \$10.00	15 1/2%
Rogers, complete, \$4.00	15 1/2%
Scalers, Fish—	
Covert's Saddlery Works	60 1/2%
Scales—	
Family, Turnbull's	50 1/2%
Counter:	
Hatch, Platform, 1/2 oz. to 4 lbs.	\$5.50
Two Platforms, 1/2 oz. to 8 lbs.	\$16.00
Union Platform, Plain	\$1.00
Union Platform, Std.	\$2.15
Challion's:	
Eureka	25%

Favorite	40%
Crocers Trip Scales	50%
Chicago Scale Co.:	
The "Little Detective"	25 1/2%
Union or Family No. 2	50%
Portable Platform (reduced list)	50%
Wagon or Stock (reduced list)	50%
"The Standard" Portables	50%
"The Standard" R. B. and Wagon	50%
Scrapers—	
Box, 1 Handle	2.25
Box, 2 Handle	2.85
Ship	2.50
Adjustable Box Scraper (S. R. & L. Co.), \$6.00	15%
Chapin-Stephens Co., Box	30 1/2%
Screens, Window and Frames—	
Maine Screen Frames	40 1/2%
See also Doors.	
Screws—Bench and Hand	
Bench, Iron, doz., 1 in., \$2.50	2.50
2 1/2; 1 1/2, \$3.00; 3/4, \$3.50	3.50
Bench, W. D. Beech, doz. 3/4, 5/8, 1/2	3.00
Hand, Wood	30 1/2%
R. Bliss Mfg. Co., Hand	30 1/2%
Chapin-Stephens Co., Hand	30 1/2%
Ohio Tool Co., Bench and Hand	30%
Coach, Lag and Hand Rail—	
Lag, Cone Point, list Oct. 1, '09	75 1/2%
Coach, Gimlet Point, list Oct. 1, '09	75 1/2%
Hand Rail, list Jan. 1, '11	70 1/2%
Jack Screws—	
Standard List	80 1/2%
Millers Falls	50 1/2%
Millers Falls, Roller	50 1/2%
P. S. & W.	50%
Sargent	70 1/2%
Swett Iron Works	75 1/2%
Machine—	
List Jan. 1, '08:	
Flat or Round Head, Iron	50 1/2%
Flat or Round Head, Brass	50 1/2%
Set and Cap—	
Set (Iron)	80%
Set (Steel), net advance over Iron	25%
Sq. Hd. Cap.	75%
Hex. Hd. Cap.	75%
Rd. Hd. Cap.	60 1/2%
Fillister Hd. Cap.	60 1/2%
Wood—	
List July 23, 1903:	
Flat Head, Iron	87 1/2%
Round Head, Iron	85 1/2%
Flat Head, Brass	85 1/2%
Round Head, Brass	80 1/2%
Flat Head, Bronze	77 1/2%
Round Head, Bronze	75 1/2%
Drive Screws	87 1/2%
Scroll Saws—	
See Saws, Scroll.	
Scythes—	
Per doz.	
Grass, No. 1, Plain Finish	\$6.25
Clipper, Bronzed Webb	\$6.50
No. 3 Clipper, Pol'd Webb	\$6.75
No. 6 Clipper & Solid Steel	\$7.00
Bush, Weed & Bramble, No. 2	\$6.50
Grain, No. 1	\$8.25
Bronzed Webb, No. 1	\$8.50
Nos. 3 & 4 Clipper, Grain	\$8.75
Solid Steel No. 6	\$9.25
Seeders, Raisin—	
Enterprise	25 1/2%
Sets—Awl and Tool—	
Aiken's Sets, Awl and Tools:	
No. 20, 1/2 doz., \$10.00	60 1/2%
Fray's Adj. Tool Handles, Nos. 1, 1 1/2, 2, \$18; 3, \$12; 4, \$8; 5, \$7	50%
C. E. Jennings & Co.'s Model Tool Holders	30%
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18	15 1/2%
Garden Tool Sets—	
Ft. Madison Three Plows, Hoe, Rake and Shovel	30 doz sets \$9.00
Sets, Nail—	
Octagon	3.50
Buck Bros.	2 1/2%
Cannon's Diamond Point	12 1/2%
Mayhew's	9.00
Snell's Corrugated, Cup Pt.	7.20
Snell's Knurled, Cup Pt.	7.20
Springfield Mach. Screw Co.:	
Diamond Knurled Cup Pt.	7.50
Regular list	75 1/2%
Saw—	
Aiken's:	
Genuine	50 1/2%
Imitation	50 1/2%
Atkin's:	
Criterion	40%
Adjustable	40%
Bemis & Call Co.'s:	
Cross Cut	30%
Plate	20%
Disston's Star and Monarch	25%
Morrill's No. 1, \$15.00	50%
Nos. 3 and 4, Cross Cut, \$20.00	50%
No. 5, Mill, \$30.00	50%
No. 10, 11, 95, \$15.00	50%
No. 1 Old Style, \$10.00	50%
Special, \$16.25	50%
Giant Royal Cross Cut	30 doz. \$8.00
Royal Hand	30 doz. \$4.50
Taintor Positive	30 doz. \$6.75
Shaving—	
Fox Shaving Sets, No. 30	30 doz., net, \$24.00
Smith & Hemenway Co.'s	80%
Sharpeners, Knife—	
Chicago Wheel & Mfg. Co.	70%
Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	\$1.50
Mounted Kitchen Sand Stone	\$1.50
Natural Grit Caring Knife Hones, 30 doz.	\$3.00
Quick Cut Emery Caring Knife Hones, 30 doz.	\$1.50
Quick Edge Pocket Knife Hones, 30 doz.	\$2.50

Skate—	
Smith & Hemenway Co.	20%
Shaves, Spoke—	
Iron	1.25
Wood	1.25
Bailey's (Stanley R. & L. Co.)	45%
Razor Edge (Stanley R. & L. Co.)	35%
Chapin-Stephens Co.	30 1/2%
Goodell's	15 1/2%
Wood's F1 and F2	50%
Shears—	
Cast Iron	7 8 9 in.
Best	16.00 18.00 20.00 gro.
Good	13.00 15.00 17.00 gro.
Cheap	5.00 6.00 7.00 gro.
Straight Trimmers, &c.:	
Best quality Jap.	70 1/2%
Best quality, Nickel	60 1/2%
Fair quality, Jap.	80 1/2%
Fair quality, Nickel	75 1/2%
Tailors' Shears	40 1/2%
Acme Cast Shears	40 1/2%
Heinisch's Tailor's Shears	10%
Wilkinson's Sheep	30 1/2%
Grass, 50 1/2%; Horse or Mule, 50 1/2%	
Tinners' Snips—	
Steel Blades	20 1/2%
Steel Laid Blades	40 1/2%
Forged Handles, Steel Blades	50 1/2%
Heinisch's Snips	40%
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in.	50%
Niagara Snips	40%
P. S. & W. Forged Handles	20%
Pruning Shears—	
Cronk's Hand Shears	33 1/2%
Cronk's Wood Handle Shears	33 1/2%
Disston's Combined Pruning Hook and Saw, 30 doz. \$18.00	25%
Disston's Pruning Hook, 30 doz. \$12.00	25%
John T. Henry Mfg. Co.	50 1/2%
Pruning Shears, all grades	50 1/2%
P. S. & W. Co.	33 1/2%
Wilkinson's Hedge, Wilcut Brand	60 1/2%
Wilkinson's Lawn and Border, Wilcut Brand	60 1/2%
Sheaves—Sliding Door—	
Stowell's Anti-Friction	50%
Patent Roller, Hatfield's, Sargent's list	70 1/2%
Reading list	33 1/2%
R. & E. list	33 1/2%
Wrightsville Hatfield Pattern	80%
Sliding Shutter—	
Reading list	40%
R. & E. list	33 1/2%
Sargent's list	10 1/2%
Shells—Shells, Empty—	
Brass Shells, Empty:	
Climax, Club, Rival, 10 and 12 gauge	65 1/2%
Paper Shells, Empty:	
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge	25 1/2%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge	20%
Climax, Union, League, New Rival, 10 and 12 gauge	25%
Climax, Union, League, New Rival, 11, 16 and 20 gauge	20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge	33 1/2%
Robin Hood, Low Brass	20 1/2%
Robin Hood, High Brass	30 1/2%
Shells, Loaded—	
Loaded with Black Powder	40%
Loaded with Smokeless Powder medium grade	40 1/2%
Loaded with Smokeless Powder high grade	40 1/2%
Robin Hood Smokeless Powder: Robin Hood, Low Brass	50%
Comets, High Brass	50 1/2%
Shoes, Horse, Mule, &c.—	
F. O. B. Pittsburgh:	
Iron	per keg \$1.00
Steel	per keg \$3.75
Burdens', all sizes	per keg \$3.90
Shot—	
Drop, up to B, 25-lb. bag	\$1.80
Drop, B and larger	per 25-lb. bag, \$2.05
Buck, 25-lb. bag	\$2.05
Chilled, 25-lb. bag	\$2.05
Shovels and Spades—	
Association List, Nov. 15, 1902	40%
Snow Shovels—	
Long Handle	\$2.75 to \$3.00
Wood and Mail, D. Handle	\$3.25 to \$3.50
Sieves and Sifters—	
Hunter's Imitation	gro. \$9.50 to \$10.00
Hunter's Genuine	per gro. \$12.00 to \$12.50
Buffalo Metallic Blue, R. M. Co., 14x16	16x20
16x20	18x20
Shaker (Barley's Pat.) Flour Sifters, 30 doz., \$2.00	20%
Sieves, Seamless Metallic—	
Per dozen:	
Mesh	14 16 18 20
Iron Wire	\$1.05 1.05 1.10 1.20
Tinned Wire	\$1.15 1.15 1.20 1.30
Sieves, Wooden Rim—	
Nested, 10, 11 and 12 inch:	
Mesh 18, Nested	30 doz. \$0.90 to 0.95
Mesh 20, Nested	30 doz. \$1.00 to 1.05
Mesh 24, Nested	30 doz. \$1.30 to 1.40
Sinks, Cast Iron—	
Painted, Standard list:	
12 x 12 to 24 x 36 in.	60 1/2%
24 x 40 to 24 x 50 in.	55%
24 x 60 to 24 x 120 in.	35%
Barnes' low list:	
Up to and including 20 x 36 in.	60%
20 x 40 to 24 x 50 in.	55%
NOTE: There is not entire uniformity in lists used by jobbers.	
Skins, Wagon—	
Cast Iron	80 1/2%
Steel	40 1/2%

Slates, School—	
Factory Shipments.	
"D" Slates.....	50@50&10%
Eureka, Uncancelled Noiseless.....	60&5 tens
Victor A, Noiseless. 60&4 tens	45%
Saw Cutters—See Cutters.	
Snaps, Harness—	
German.....	40@40&10%
Covert Mfg. Co.:	
Derby.....	30&2%
High Grade.....	45%
Jockey.....	35%
Trojan.....	45%
Yankee.....	30&2%
Yankee Roller.....	30&2%
Covert's Saddlery Works:	
Crown.....	60%
German.....	60%
Model.....	60%
Triumph.....	60%
Oneida Community:	
Harness Snaps, 1 inch.....	60&5
Swivel Snaps.....	60%
Swivels.....	50%
Sargent's Patent Guarded.....	60&5&10%
Snaths—	
Scythe.....	50%
Snips, Tinners—See Shears.	
Spoons and Forks—	
Silver Plated—	
Good Quality.....	50&10(60&45%
Cheap.....	60@60&10%
International Silver Co.:	
1847 Rogers Bros. and Rogers & Hamilton.....	40&10%
Rogers & Bro., William Rogers.....	50&10%
Eagle Brand.....	50&10%
Anchor, Rogers Brand.....	60%
Wm. Rogers & Son.....	60&10%
Miscellaneous—	
German Silver.....	60@60&5%
Cattaraugus Cutlery Co.:	
Seneca Silver.....	50%
Tinned Iron—	
Teas.....	per gro. 45&10%
Tables.....	per gro. \$0.50@1.00
Springs—Door—	
Chicago (Coil).....	40&10%
Gem (Coil).....	20%
Pullman (Coil).....	25%
Reliance (Coil).....	40&10%
Star (Coil).....	30%
Torrey's Rod, 39 in.....	30 doz. \$1.10
Victor (Coil).....	50&10&10%
Carriage, Wagon, &c.—	
1 1/2 in. and Wider:	Per lb.
Black.....	40@44¢
Half Bright.....	40@44¢
Bright.....	40@44¢
Painted Seat Springs:	
1 1/2 x 2 x 26.....	per pr. 42¢
1 1/2 x 3 x 28.....	per pr. 70¢
Sprinklers, Lawn—	
Enterprise.....	25&30%
Philadelphia No. 1, 30 doz. \$12; No. 2, \$15; No. 3, \$24.....	30%
Pleuger & Henger Mfg. Co.:	
Cactus.....	70%
Japanese.....	75%
Nationals.....	65%
Squares—	
Nickel plated.....	List Jan. 5, 1900.
Steel and Iron.....	75&10@75&10&5%
Roscowood Hdl. Try Square and T-Bevels.....	60&10&10@70%
Iron Hdl. Try Square and T-Bevels.....	40&10@40&10&10%
Diston's Try Sq. and T-Bevels.....	70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2.....	50%
Squeezers, Lemon	
Wood, Common, gro. No. 0, \$5.25@5.50; No. 1, \$6.25@6.50.	
Wood, Porcelain Lined:	
Cheap.....	doz. \$1.00
Good Grade.....	doz. \$1.25
Tinned Iron.....	doz. \$0.75@1.25
Iron, Porcelain Lined.....	doz. \$1.75
Staples—	
Barbed Blind.....	lb. 6@7 1/4¢
Electricians', Association list.....	80&10&10&10%
Fence Staples, Plain, .62, 25; Galvanized.....	\$2.55
Poultry Netting Staples.....	per lb. 5 1/2(63 1/4¢)
Grand Crossing Tack Co.'s list.....	80&10%
Steels, Butchers'—	
Dick's.....	30%
Foster Bros.....	30%
C. & A. Hoffmann's.....	40%
Steelyards —	
.....	30@30&10%
Stocks and Dies—	
Blacksmith's.....	50@50&10%
Curtis Rev. Bl. Ratchet Die Stock.....	25%
Derby Screw Plates.....	25%
Green River.....	25%
Lightning Screw Plate.....	25%
Little Giant.....	25%
Reece's New Screw Plates.....	25%
Stoners, Cherry—	
Enterprise.....	25&30%
Stones—Oil, &c.	
Chicago Wheel & Mfg. Co., 1904 list:	
Gem Corundum Oil, Double Grit.....	60%
Gem Corundum Axe, Single or Double.....	60%
Gem Corundum Slips.....	60%
Gem Corundum Razor Hones.....	50%
Pike Mfg. Co., 1904 list:	
Arkansas St. No. 1, 3 to 5 1/2 in.....	\$2.80
Arkansas St. No. 1, 5 1/2 to 8 in.....	\$3.50
Arkansas Slips No. 1.....	\$1.40
Lily, White Washita, 4 to 8 in.....	30¢
Rosy Red Washita, 4 to 8 in.....	30¢
Washita St., Extra, 4 to 8 in.....	50¢
Washita St., No. 1, 4 to 8 in.....	40¢
Washita St., No. 2, 4 to 8 in.....	30¢
Washita Slips.....	30¢
Rosy Red Slips.....	30¢
Washita Slips, Extra.....	30¢
Washita Slips, No. 1.....	70¢
Washita Slips, No. 2.....	40¢
India Oil Stones (entire list).....	35¢
Quickest Emery and Corundum Oil.....	35¢
Stone, Double Grit.....	35¢
Quickest Emery and Corundum.....	35¢
Stone, Double Grit.....	35¢

Quickcut Emery Rubbing Bricks, 3 1/2 x 5 1/2 x 1 1/2 in. 10¢
Hindustan No. 1, R's lar. 10¢
Hindustan No. 1, Small, 10¢
Axe Stones (all kinds) 10¢
Turkey Oil Stones, Extra, 5 to 8 in. 10¢
Queer Creek Stones, 4 to 8 in. 10¢
Queer Creek Slips, 4 to 8 in. 10¢
Sand Stone, 6 in. 10¢

Scythe Stones—
Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., \$5.00
gro., 12 in., \$10.00
Norton Emery Scythe Stones:
Less than gross lots, \$9.00
One gross or more, \$7.20
Lots of 10 gross or more, \$6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S., 10 in., \$12.00
Lamotte S. S., 10 in., \$11.00
White Mountain S. S., 10 in., \$10.00
Green Mountain S. S., 10 in., \$9.00
Extra Indian Pond S. S., 10 in., \$7.50
No. 1 Indian Pond S. S., 10 in., \$7.00
No. 2 Indian Pond S. S., 10 in., \$4.50
Leader Red End S. S., 10 in., \$4.50
Quick Cut Emery, 10 in., \$3.00
Pure Corundum, 10 in., \$3.00
Crescent, 10 in., \$2.00
Emery Scythe Rifles, 2 Coat, \$8
Emery Scythe Rifles, 3 Coat, \$10
Emery Scythe Rifles, 4 Coat, \$12
Balance of 1901 list 33 1/2%

Stoppers, Bottle—
Victor Bottle Stoppers, 10 in., \$9.00
Stops— Bench—
Millers Falls, 10 in., \$15.00
Morrill's, No. 2, No. 1, \$10.00
Morrill's, No. 2, \$12.50

Door—
Chapin-Stephens Co., 60¢
Plane—
Chapin-Stephens Co., 20¢
Straps— Box—
Cary's Universal, case lots, 25¢
Hame—
Covert's Saddlery Works, 60¢

Stretchers, Carpet—
Cast Iron, Steel Points, doz., 60¢
Socket—
Bullard, 10 in., \$1.00
Excelsior Stretcher and Tack Hammer Combined, 10 in., \$2.00

Strops, Razor—
Star Diagonal Strop, 25¢
Stuffers, Sausage—
Enterprise Mfg. Co., 25¢
National Specialty Co., list Jan. 1, 1902, 30¢

Sweepers, Carpet—
National Sweeper Co.:
Louis XV, Roller Bearing, 10 in., \$12.00
Hepburn, Roller Bearing, 10 in., \$12.00
Sheraton, Roller Bearing, 10 in., \$12.00
Ye Mission, Roller Bearing, 10 in., \$12.00
Transparent, Roller Bearing, 10 in., \$12.00
Glass top, Nickel, 10 in., \$12.00
National Queen, Roller Bearing, 10 in., \$12.00
Fancy Veneers, 10 in., \$12.00
Loyal, Roller Bearing, 10 in., \$12.00
Nickel, 10 in., \$12.00
Triple Medal, Roller Bearing, 10 in., \$12.00
Marion, Roller Bearing, 10 in., \$12.00
Marion Queen, Roller Bearing, 10 in., \$12.00
Nickel, 10 in., \$12.00
Monarch, Roller Bearing, 10 in., \$12.00
Monarch, Roller Bearing, 10 in., \$12.00
Perpetual, Regular B'r'g, 10 in., \$12.00
Perpetual, Regular B'r'g, 10 in., \$12.00
Monarch Extra (17 in. case), Roller Bearing, 10 in., \$12.00
Monarch Extra (17 in. case), Roller Bearing, 10 in., \$12.00
Auditorium (25 in. case), Roller Bearing, 10 in., \$12.00
Mammoth (30 in. case), Roller Bearing, 10 in., \$12.00
NOTE—Rebates: 50¢ per dozen on three-dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$3.50 per dozen on twenty-five-dozen lots.
Streator Metal Stamping Co.:
Model E, Sanitary, 10 in., \$25.00
Model A, Sterling, 10 in., \$25.00
Model B, Sterling, 10 in., \$25.00
Model B, Sterling, Japanned, 10 in., \$25.00
Model C, Sterling, 10 in., \$25.00
Model D, Sterling, 10 in., \$25.00

Tacks, Finishing Nails, &c.
New List, May 1, 1905.
American Carpet Tacks, 90¢
Sweeds Cut Tacks, 90¢
Sweeds Upholsterers', 90¢
Gimp Tacks, 90¢
Lace Tacks, 90¢
Trimmers' Tacks, 90¢
Looking Glass Tacks, 90¢
Bill Posters' and Railroad Tacks, 90¢
Hungarian Nails, 85¢
Finishing Nails, 70¢
Nails and Clout Nails, 80¢

NOTE—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10% is given on Light weights.
Miscellaneous—
Double Pointed Tacks, 90¢
See also Nails, Wire.

Tanks, Oil—
Emerald, R. M. Co., 30-gal., \$3.40
Emerald, R. M. Co., 60-gal., \$4.25
Queen City, R. M. Co., 30-gal., \$3.65
Queen City, R. M. Co., 60-gal., \$4.50

Tapes, Measuring—
American Asses' Skin, 50¢
Patent Leather, 25¢
Steel, 33 1/2¢
Chesterman's, 25¢

Eddy Asses' Skin, 40¢
Eddy Patent Leather, 25¢
Eddy Steel, 40¢
Keuffel & Esser Co., 40¢
Favorite, Ass Skin, 40¢
Favorite, Duck and Leather, 40¢
Metallic and Steel, lower list, 35¢
Pocket, 35¢
Lufkin's: Asses' Skin, 40¢
Metallic, 30¢
Patent Bend, Leather, 25¢
Pocket, 40¢
Steel, 33 1/2¢

Teeth, Harrow—
Steel Harrow Teeth, plain or headed, 5/8-inch and larger, per 100 lbs., \$2.75 to \$3.00

Thermometers—
Tin Case, 80¢
Ties, Bale—Steel Wire—
Single Loop, 80¢
Monitor, Cross Head, 70¢

Brick Ties—
Niagara Brick Ties, 25¢
Tinners' Shears, &c.—
See Shears, Tinners', &c.

Tinware—
Stamped, Japanned and Piced, sold very generally at net prices.
Tips, Safety Pole—
Covert's Saddlery Works, 60¢

Tire Benders, Upsetters, &c.
See Benders and Upsetters, Tire.
Tools—Coopers—
L. & I. J. White, 20¢

Hay—
Myers' Hay Tools, 50¢
Stowell's Hay Forks, 50¢
Stowell's Fork Pulleys, 50¢

Miniature—
Smith & Hemenway Co.'s, 25¢
Saw—
Atkins' Cross Cut Saw Tools, 40¢
Simonds' Improved, 33 1/2¢
Simonds' Crescent, 25¢

Ship—
L. & I. J. White, 25¢
Transom Lifters—
See Lifters, Transom.

Traps—Fly—
Balloon, Globe or Acme, doz., \$1.15 to \$1.25; gro., \$1.10 to \$1.20
Harper, Champion or Paragon, doz., \$1.25 to \$1.40; gro., \$1.10 to \$1.30

Game—
Imitation Onocida, 75¢
Newhouse, 40¢
Hawley & Norton, 70¢
Onocida Community Jump, 50¢

Mouse and Rat—
Mouse, Wood, Choker, doz. holes, 8 1/2¢
Mouse, Round or Square Wire, doz., 85¢

Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each \$1.21; doz., \$13.25
No. 3, Rat, doz., \$6.50; case of 50, \$5.75
No. 3 1/2, Rat, doz., \$5.25; case of 12, \$4.70
No. 4, Mouse, doz., \$3.95; case of 150, \$3.00
No. 5, Mouse, doz., \$3.00; case of 150, \$2.25

Trimmers, Spoke—
Wood's E 1, 50¢
Trowels—
Diston Brick and Pointing, 30¢
Diston Plastering, 25¢
Diston "Standard Brand" and Garden Trowels, 35¢
Kohler's Steel Garden Trowels, 5 in., 40¢
Kohler's Steel Garden Trowels, 6 in., 40¢
Never-Break Steel Garden Trowels, 5 in., 40¢
Rose Brick and Plastering, 25¢
Woodrough & McParlin, Plastering, 25¢

Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern, 50¢
Western Pattern, 60¢
Handy Trucks, 10¢
Grocery, 10¢
Store Trucks, Improved Pat-tern, 10¢
McKinney Trucks, each \$10.00
Model Store Trucks, 10¢

Tubs, Wash—
No. 1, 2, 3
Galvanized, per doz., \$4.25 to \$5.25
Galvanized Wash Tubs (R. M. Co.):
No. 1, 2, 3, 10, 20, 30
Per doz., net, \$5.70 to \$6.30 to \$6.60 to \$7.20 to \$8.10

Twine, Miscellaneous—
Flax Twine: BC. B.
No. 9, 1/4 and 1/2 lb. Balls, 22¢
No. 12, 1/4 and 1/2 lb. Balls, 18¢
No. 18, 1/4 and 1/2 lb. Balls, 16¢
No. 24, 1/4 and 1/2 lb. Balls, 16¢
No. 36, 1/4 and 1/2 lb. Balls, 15¢
Chalk Line, Cotton, 1/2 lb., 25¢
Cotton Mops, 6, 9, 12 and 15 lb., to doz., 10¢
Cotton Wrapping, 5 Balls to lb., according to quality, 14¢
American 2-Ply Hemp, 1/4 and 1/2 lb. Balls, 13¢
American 3-Ply Hemp, 1-lb. Balls, 13¢
India 2-Ply Hemp, 1/4 and 1/2 lb. Balls (Spring Twine), 9¢
India 3-Ply Hemp, 1-lb. Balls, 9¢
India 3-Ply Hemp, 1 1/2 lb. Balls, 7¢
2, 3, 4 and 5-Ply Jute, 1/2 lb. Balls, 9¢
Mason Line, Linen, 1/2 lb. Bls., 16¢
No. 26 1/2 Mattress, 1/4 and 1/2 lb. Balls, 3¢
Wool, 3 to 6 ply, B 6¢; A 6 1/2¢

Vises—

Solid Box— 60%
Parallel—

Athol Machine Co.:
Simpson's Adjustable, 40¢
Standard, 40¢
Amateur, 40¢
Columbian Hdw. Co., 40¢
Emmert Universal:
Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.
Machinist and Tool Makers' No. 1A, \$12.50; No. 5A, \$7.00; No. 6A, \$10.00; No. 10A, \$22.50.

Presto Quick Acting, 25¢
Tiger Machinists', 40¢
Fisher & Norris Double Screw, 15¢
Hollands:
Machinists', 40¢
Keystone, 65¢

Levis Tool Co.:
Adjustable Jaw, 30¢
Monarch, 40¢
Solid Jaw, 50¢
Massey Vice Co.:
Cinch, 40¢
Perfect, 20¢
Lightning Grip, 20¢
Merrill's, 20¢
Millers Falls, 60¢
Parker's:
Victor, 20¢
Regulars, 20¢
Vulcan's, 40¢
Combination Pipe, 55¢
Prentiss, 20¢
Sargent's, 40¢
Snediker & X. L., 33 1/2¢
Stephens, 33 1/2¢
Williamson Mfg Co., Double Swivel, 10¢

Saw Filers—
Disston's D 3 Clamp and Guide, 30¢
doz., \$30.00
Perfection Saw Clamps, 10¢
Reading, 40¢
Wentworth's Rubber Jaw, Nos. 1, 2 and 3, 45¢

Wood Workers—
Massey Vice Co.:
Lightning Grip, 15¢
Perfect, 15¢
Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.

Miscellaneous—
Bignall & Keeler Combination Pipe Vice, 60¢
Holland's Combination Pipe, 60¢
Massey's Quick Action Pipe, 40¢
Parker's Combination Pipe:
87 Series, 60¢
157 Series, 60¢
No. 50, 40¢
Williamson Mfg Co., Double Swivel Combination Pipe, 10¢

Wads—Price per M.
B. E., 11 up, 60¢
B. E., 9 and 10, 70¢
B. E., 8, 80¢
B. E., 7, 80¢
P. E., 11 up, 1.00
P. E., 9 and 10, 1.25
P. E., 8, 1.50
P. E., 7, 1.50
Ely's B. E., 11 and larger, \$1.70 to \$1.75
Ely's P. E., 12 to 20, \$3.00 to \$3.25

Ware, Hollow—
Cast Iron, Hollow—
Stove Hollow Ware:
Enameled, 55¢
Ground, 60¢
Plain or Unground, 65¢
Country Hollow Ware, per 100 lbs., \$3.75

White Enameled Ware:
Maslin Kettles, 70¢
Covered Ware
Tinned and Turned, 40¢
Enameled, 50¢
See also Pots, Glue.

Enameled—
Agate Nickel Steel Ware, 60¢
Iron Clad Ware, 70¢
Lava, Enameled, 40¢
Never Break Enameled, 50¢

Tea Kettles—
Galvanized Tea Kettles:
Inch, 4 1/2 7 8 9
Each, 45¢ 50¢ 55¢ 65¢
Steel Hollow Ware—
Avery Spiders and Griddles, 65¢
Avery Baitles, 60¢
Porcelain, 50¢
Never Break Spiders and Griddles, 65¢
Never Break Kettles, 60¢
Solid Steel Spiders and Griddles, 65¢
Solid Steel Kettles, 60¢

Warmers, Foot—
Pike Mfg. Co., Soapstone, 40¢
Washboards—
Solid Zinc:
Crescent, family size, bent frame, 32¢
Red Star, family size, stationary protector, 32¢
Double Zinc Surface:
Saginaw Globe, family size, stationary protector, 29¢
Cable Cross, family size, stationary protector, 31¢
Single Zinc Surface:
Naiaid, family size, open back, perforated, 25¢
Saginaw Globe, protector, family size, ventilated back, 29¢
Brass Surface:
Brass King, Single Surface, open back, 25¢
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface, 25¢
Glass Surface:
Glass King, Single Surface, open back, 25¢
Enamel Surface:
Enamel King, Single Surface, ventilated back, 25¢

Washers—Leather, Axle—
Solid, 60¢
Patent, 90¢
Coil: 1/4 1 1/4 1 1/2 1 3/4 per doz, 10¢ 11¢ 12¢ 13¢

Iron or Steel—

Size bolt, 5-16 1/4 1/2 3/4 1
Washers, \$5.70 4.80 3.50 3.30 3.10
The above prices are based on 5.70¢ off list.
In lots less than one keg add 1/2¢ per lb.; 5-lb. boxes add 1/2¢ to list.

Cast Washers—
Over 1/2 inch, barrel lots, per lb., 1 1/2¢

Weather Strip—
Flexible Felt:
Lined, per 100 ft., \$2; \$3; 40¢
Moore's Unlined, per 100 ft., \$2; \$3; 40¢
Moore's, 50¢

Wedges—
Oil Finish, 1 lb., 2.70 to 2.80¢
Weights—Hitching—
Covert Mfg. Co., 40¢
Covert's Saddlery Works, 60¢

Sash—
Per ton, f.o.b. factory:
Eastern District, \$27.50 to \$28.00
Southern Territory, \$20.00 to \$23.00
Western and Central Districts, \$23.00 to \$25.00

Wheels, Well—
8-in., \$1.55; 10-in., \$3.00; 12-in., \$2.50; 14-in., \$3.00.

Wire and Wire Goods—
Bright and Annealed:
6 to 9, 80¢
10 to 18, 80¢
19 to 26, 80¢
27 to 36, 80¢

Galvanized:
6 to 9, 75¢
10 to 14, 75¢
15 to 16, 72¢
19 to 26, 75¢
27 to 36, 72¢

Coppered:
6 to 9, 75¢
10 to 14, 75¢
15 to 18, 72¢
19 to 26, 75¢
27 to 36, 72¢

Tinned:
6 to 14, 75¢
15 to 18, 75¢
Annealed, Steel and Tinned, on Spools, 70¢
Brass and Copper on Spools, 60¢

Brass, list Feb. 26, '96, 15¢
Copper, list Feb. 26, '96, 25¢
Cast Steel Wire, 50¢
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—
List June 24, '03, 90¢
Brass Cup Hooks and Brass Screw Hooks, 85¢
Wire Cloth and Netting:
Galvanized Wire Netting, 80¢

Painted Screen Cloth, 100 ft., \$1.10
Standard Galv. Hardware Grade:
Nos. 2, 2 1/2 & 3 Mesh, sq. ft. 3¢
Nos. 4 and 5 Mesh, sq. ft. 3 1/2¢
No. 6 Mesh, sq. ft. 3 1/2¢
No. 8 Mesh, sq. ft. 4¢

Wire, Barb— See Trade Report
Wrenches—
Agricultural, 75¢
Alligator or Crocodile, 70¢
Baxter Pattern S Wrenches, 70¢
Drop Forged S, 70¢
Acme, 45¢
Alligator Pattern, 70¢
Bull Dog, 70¢
Bemis & Call's:
Adjustable S, 40¢
Adjustable S Pipe, 40¢
Bemis Pipe, 40¢
Briggs Pattern, 40¢
Combination Black, 40¢
Combination Bright, 40¢
Merrick Pattern, 50¢
Boardman's, 40¢
Coe's Genuine Knife Hdl., 40¢
Coe's Genuine Steel Hdl., 40¢
Coe's Genuine Key Model, 40¢
Coe's, Genuine Hammer Handle, 40¢
Coe's "Mechanics", 40¢
Donohue's Engineer, 40¢
Eagle, 40¢
Elgin Wrenches, 40¢
Elgin Retreading Attachment, 40¢
Elgin Extra Dies, 40¢
Elgin Extra Jaws, 40¢
Elgin Monkey Wrench Pipe Jaws, 40¢
Gem Pocket, 40¢
Hercules, 40¢
W & B Machinist:
Case lots, 50¢
Less than case lots, 50¢
Solid Handles, P. S. & W., 50¢
Stillson, 50¢
Vulcan Chain, 50¢

Fruit Jar—
Triumph Fruit Jar Wrench, 5 gross lots, \$7.50; 10 gross, \$8.00

Wringers—
Tuttle Roller Press Mop Pail Wringer, each, \$8.00; 10 doz., \$18.00

Wrought Goods—
Staples, Hooks, &c., list March 17, '02, 90¢

Yokes, Neck—
Covert Saddlery Works, Trimmed, 70¢
Covert Saddlery Works, Neck Yokes, 70¢
Yokes, Ox, and Ox Bows:
Fort Madison's Farmers' & Freighters, list net

Zinc—
Sheet, per 100 lbs., \$3.00 to \$2.50

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1½ in. round and square.....	\$ 2.00¢
1½ to 4 in. x ½ to 1 in.....	\$ 2.20¢
1½ to 4 in. x ½ to 5-16 in.....	\$ 2.30¢
Rods—¾ and 1-16 round and square.....	\$ 2.30¢
Angles:	
3 in. x ¾ in. and larger.....	\$ 2.40¢
(except 3½ in. and 4 x ½ 2.50¢)	
3 in. x 5-16 in. and ¾ in.....	\$ 2.55¢
1½ to 2½ in. x ¾ in.....	\$ 2.80¢
1½ to 2½ in. x 5-16 in. and thicker.....	\$ 2.80¢
1 to 1½ in. x 3-16 in.....	\$ 2.85¢
1 to 1½ in. x ½ in.....	\$ 2.40¢
¾ x ¾ in.....	\$ 2.55¢
¾ x ¾ in.....	\$ 2.65¢
¾ x ¾ in.....	\$ 3.70¢
¾ x 5-16 in.....	\$ 4.20¢
Tees:	
1 in.....	\$ 2.65¢
1½ in.....	\$ 2.45¢
1½ to 2½ in.....	\$ 2.35¢
3 in. and larger.....	\$ 2.50¢
Beams.....	\$ 2.90¢
Channels, 3 in. and larger.....	\$ 2.30¢
Bands—1½ to 6 x 5-16 to No. 8.....	\$ 2.35¢
"Burden's Best" Iron, base price.....	\$ 3.05¢
"Burden's" "H. B. & S." Iron, base price.....	\$ 3.00¢
"Ulster".....	\$ 3.10¢
Norway Bars.....	\$ 3.40¢
Norway Shapes.....	\$ 3.80¢

Merchant Steel from Store—

Bessemer Machinery.....	per lb.	\$ 2.00¢
Toe Calk, Tire and Sleigh Shoe.....		\$ 2.80¢
Best Cast Steel, base price in small lots.....		\$ 7¢

Sheets from Store—

Black.

	One Pass, C.R.	R. G.
	Soft Steel.	Cleaned.
No. 14.....	\$ 2.55¢	\$ 2.80¢
Nos. 18 to 21.....	\$ 2.85¢	\$ 2.90¢
No. 27.....	\$ 3.00¢	\$ 3.30¢
No. 28.....	\$ 3.10¢	\$ 3.40¢

Russia, Planished, &c.

Genuine Russia, according to assort- ment.....	\$ 11¼¢@14¢
Patent Planished.....	\$ 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16.....	\$ 8.05¢
Nos. 22 to 24.....	\$ 8.45¢
No. 27.....	\$ 8.90¢
No. 28.....	\$ 9.15¢
No. 20 and lighter 36 inches wide, 25¢ higher.	

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20.....	\$6.30
IX, 14 x 20.....	7.55
A. Charcoal:	
IC, 14 x 20.....	\$5.35
IX, 14 x 20.....	6.45

American Coke Plates—Bessemer—

IC, 14 x 20.....	108 lb.	\$4.25
IX, 14 x 20.....		5.25

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating.....	\$8.40
IX, 20 x 28 with an 8 lb. coating.....	10.40

Seamless Brass Tubes—

Outside Diameter.				Net.				Base Price 2¢				
Stub's W. G.	¾	5-16	¾	7-16	¾	9-16	¾	¾	¾	1	1¼	1½
4-11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	28	29	27	27	22	22
13	..	..	..	..	..	..	29	29	27	27	22	22
14	..	..	..	..	29	29	29	27	27	27	23	23
15	..	..	..	30	29	29	29	27	27	27	23	23
16	..	..	..	30	29	29	29	27	27	27	23	23
17	..	33	31	30	29	29	29	27	27	27	25	25
18	53	35	31	31	30	30	30	28	28	28	26	26
19	62	38	31	31	30	30	30	28	28	28	27	27
20	64	35	31	31	30	30	30	28	28	28	27	27
21	66	51	33	32	32	32	29	29	29	29	29	29
22	67	53	33	32	32	33	33	31	30	30	30	30
23	61	53	37	37	33	33	33	33	33	33	33	33
24	81	66	53	48	46	45	44	43	41	40	40	41
25	86	71	56	51	47	47	46	45	44	44	45	46

Iron Pipe Sizes—Brass

¾	¾	¾	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
30	29	24	23	22	22	22	22	22	22	22	21	26	25	20¢ lb

Braze Brass Tubing.

Discount from List June 6, 1898, 20.5%.

Bronze and Copper Tubing advance on Brass List 3¢

Roll and Sheet Brass—

Discount from List June 6, 1898, 15%.

Brass Wire.

Discount from List June 6, 1898, 15%

Brass Rods.

Discount from List 15%

METALS—

Tin—

Straits Pig.....	\$ 37½¢@38½¢
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Copper—

Lake Ingot.....	\$ 19 @19¼¢
Casting.....	\$ 18½¢@19 ¢
Sheet Copper Hot Rolled, 16 oz.....	\$ 23¢
Sheet Copper Cold Rolled, 1¢ advance over Hot Rolled.....	\$ 24¢
Sheet Copper Polished 20 in. wide and under, 1¢ ad- vance over Cold Rolled.....	
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.....	
Bottoms, Pits and Flats.....	\$ 27¢ basis
Planished Copper, 1¢ advance more than Polished.....	

Spelter—

Western.....	\$ 6¼¢ @ 7 ¢
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Zinc.

No. 9, base, casks, \$ 8¼¢ Open.....	\$ 8½¢
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Lead.

American Pig.....	\$ 5¼¢@6 ¢
Bar.....	\$ 6¼¢@7 ¢

Soldier.

½ & ¾, guaranteed.....	\$ 28¼¢@24 ¢
No. 1.....	\$ 21¼¢@22¼¢
Refined.....	\$ 20¢@20¼

Prices of Soldier indicated by private brand vary according to composition.

Antimony—

Cookson.....	\$ 18 ¢
U. S.....	\$ 18 ¢
Other Brands.....	\$ 17¢@18¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots.....	\$ 39¢
100-lb lots.....	\$ 37¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Copper, Heavy Cut and Crucible.....	\$ 15.75¢
Copper, Heavy and Wire.....	\$ 15.50¢
Copper, Light and Wire.....	\$ 14.25¢
Heavy Brass.....	\$ 10.75 ¢
Light Brass.....	\$ 8.75 ¢
Lead.....	\$ 5.00 ¢
Tea Lead.....	\$ 4.75 ¢
Zinc.....	\$ 4.75 ¢
Pure Aluminum, Sheet.....	\$ 22 ¢
No. 1 Yard Wrought.....	\$ 16.00@17.00
Wrought Pipe.....	\$ 13.00@13.50
No. 1 Machinery Cast.....	\$ 14.00@14.75
Stove Plate.....	\$ 11.00@11.50

THE IRON AGE

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